

Health and Safety Plan
for
Test Pitting and Soil Sampling
at
Site 6A - Fuel Calibration Area and
Site 2 - Fire Training Area

**Naval Weapons Industrial
Reserve Plant**
Calverton, New York



Engineering Field Activity Northeast
Naval Facilities Engineering Command

Contract No. N62467-90-D-1298

Contract Task Order 0223

June, 2001



TETRA TECH NUS, INC.

**HEALTH AND SAFETY PLAN
FOR
TEST PITTING AND SOIL SAMPLING
AT
SITE 6A – FUEL CALIBRATION AREA AND
SITE 2 – FIRE TRAINING AREA**

**NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
CALVERTON, NEW YORK**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION-NAVY (CLEAN) CONTRACT**

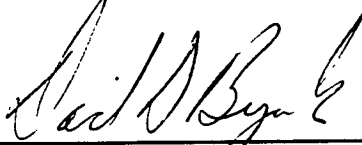
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**CONTRACT NUMBER N62467-90-D-1298
CONTRACT TASK ORDER 0223**

JUNE, 2001

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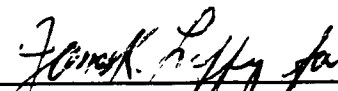

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1.0 INTRODUCTION

This Health and Safety Plan (HASP) addresses investigation activities to be conducted at the Naval Weapons Industrial Reserve Plant, located in Calverton, New York as part of Contract Task Order (CTO) 0223. Specifically, this HASP addresses the activities related to the performance of a Remedial Investigation (RI).

The activities conducted as part of this investigation include the excavation of trenches at Site 2 and Site 6A for the purpose of collecting soil samples and determining the presence of free product.

This HASP is being prepared for NWIRP Calverton as part of an overall effort conducted under Comprehensive Long-Term Environmental Action Navy (CLEAN) administered through the U.S. Navy Engineering Field Activities Northeast Naval Facilities Engineering Command, as defined under Contract Number N62467-90-D-1298. In addition to the HASP, a copy of the Tetra Tech NUS, Inc. (TtNUS) Environmental Health and Safety Guidance Manual must be present at the site during the performance of site activities. The Guidance Manual provides supporting information pertaining to the HASP, as well as TtNUS Standard Operating Procedures (SOP's). Both documents must be present at the site to comply with the requirements stipulated in the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120.

This HASP has been developed using the latest available information regarding known or suspected chemical contaminants and potential physical hazards associated with the proposed work and site. The HASP will be modified if new information becomes available. All changes to the HASP will be made by the Project Health & Safety Officer (PHSO) and approved by the TtNUS CLEAN Health and Safety Manager (HSM) and the Project Manager (PM). The PM will notify affected personnel of all changes.

1.1 KEY PROJECT PERSONNEL AND ORGANIZATION

This section defines responsibility for site safety and health for TtNUS and subcontractor employees engaged in onsite activities. Personnel assigned to these positions will exercise the primary responsibility for all onsite health and safety. These persons will be the primary points of contact for any questions regarding the safety and health procedures and the selected control measures that are to be implemented for onsite activities.

- The TtNUS PM is responsible for the overall direction of health and safety for this project.

- The PHSO is responsible for developing this HASP in accordance with applicable OSHA regulations. Specific responsibilities include:
 - i. Providing information regarding site contaminants and physical hazards associated with the site.
 - ii. Establishing air monitoring and decontamination procedures.
 - iii. Assigning personal protective equipment based on task and potential hazards.
 - iv. Determining emergency response procedures and emergency contacts.
 - v. Stipulating training requirements and reviewing appropriate training and medical surveillance certificates.
 - vi. Providing standard work practices to minimize potential injuries and exposures associated with hazardous waste work.
 - vii. Modifying this HASP, as it becomes necessary.
- The TtNUS Field Operations Leader (FOL) is responsible for implementation of the HASP with the assistance of an appointed SSO. The FOL manages field activities, executes the work plan, and enforces safety procedures as applicable to the work plan.
- The SSO supports site activities by advising the FOL on all aspects of health and safety on site. These duties may include:
 - i. Coordinates all health and safety activities with the FOL.
 - ii. Selects, applies, inspects, and maintains personal protective equipment.
 - iii. Establishes work zones and control points in areas of operation.
 - iv. Implements air monitoring program for onsite activities.
 - v. Verifies training and medical clearance of onsite personnel status in relation to site activities.
 - vi. Implements Hazard Communication, Respiratory Protection Programs, and other associated health and safety programs as they may apply to site activities.
 - vii. Coordinates emergency services.
 - viii. Provides site-specific training for all onsite personnel.
 - ix. Investigates all accidents and injuries (see Attachment I - Illness/Injury Procedure and Report Form)
 - x. Provides input to the PHSO regarding the need to modify, this HASP, or applicable health and safety associated documents as per site-specific requirements.
- Compliance with the requirements stipulated in this HASP is monitored by the SSO and coordinated through the TtNUS CLEAN HSM.

Note: In some cases one person may be designated responsibilities for more than one position. For example, at NWIRP the FOL may also be responsible for SSO duties. This action will be performed only as credentials, experience, and availability permits.

1.2 SITE INFORMATION AND PERSONNEL ASSIGNMENTS

Site Name: NWIRP Calverton Address: Suffolk County, New York
Remedial Project Manager: Jim Colter Phone Number: (610) 595-0567 ext. 163
Site Contact: Al Taormina Phone Number: (516) 346-0344

Purpose of Site Visit: This activity is divided into a multi-task operation (see Section 4.0), consisting of test pit excavations and the collection of subsurface soil samples.

Proposed Dates of Work: June, 2001 until project completion

Project Team:

TtNUS Personnel:

David D. Brayack, P.E.

TBD

Matthew M. Soltis, CIH, CSP

Donald J. Westerhoff, CSP

TBD

Non-TtNUS Personnel

TBD

Discipline/Tasks Assigned:

Project Manager (PM)

Field Operations Leader (FOL)

CLEAN Health and Safety Manager (HSM)

Project Health and Safety Officer (PHSO)

Site Safety Officer (SSO)

Affiliation/Discipline/Tasks Assigned

Excavation Subcontractor(s)

Hazard Assessments (for purposes of 29 CFR 1910.32) and HASP preparation conducted by:

Donald J. Westerhoff, CSP

TBD - To be determined

2.0 EMERGENCY ACTION PLAN

2.1 INTRODUCTION

This section is part of a preplanning effort to direct and guide field personnel in the event of an emergency. In the event of onsite emergencies that cannot be handled by onsite personnel, they will be evacuated to a safe place of refuge, and the appropriate emergency response agencies will be notified. Because a majority of potential emergency situations will require assistance from outside emergency responders, TtNUS and subcontractor personnel will not provide emergency response support for significant emergency events beyond responding to easily controlled minor incidents. The emergency response agencies listed in this plan are capable of providing the most effective response and are designated as the primary responders. These agencies are located within a reasonable distance from the area of operations, a factor that ensures adequate emergency response time. This emergency action plan conforms to the requirements of OSHA Standard 29 CFR 1910.38(a), as allowed in OSHA 29 CFR 1910.120(l)(1)(ii).

TtNUS will, through necessary services, include initial response measures for incidents such as:

- Initial fire-fighting support and prevention
- Initial spill control and containment measures and prevention
- Removal of personnel from emergency situations
- Provision of initial medical support for injury/illness requiring only first-aid level support
- Provision of site control and security measures as necessary

2.2 PRE-EMERGENCY PLANNING

Through the initial hazard/risk assessment effort, injury or illness resulting from exposure to chemical or physical hazards or fire are the most probable emergencies that can be encountered during site activities. To minimize and eliminate these potential emergency situations, pre-emergency planning activities associated with this project include the following. The SSO and/or the FOL are responsible for:

- Coordinating response actions with local municipal Emergency Services personnel to ensure that TtNUS emergency action activities are compatible with existing facility emergency response procedures.
- Establishing and maintaining information at the project staging area (Support Zone) for easy access in the event of an emergency. This information includes the following:
 - Chemical Inventory (for substances used onsite), with Material Safety Data Sheets.
 - Onsite personnel medical records (medical data sheets).

- A logbook identifying personnel onsite each day.
- Emergency notification phone numbers in all site vehicles
- Identifying a chain of command for emergency action.
- Educating site workers to the hazards and control measures associated with planned activities at the site, and providing early recognition and prevention, where possible.

It is the responsibility of the TtNUS FOL to ensure that this information is available and present at the site.

2.3 EMERGENCY RECOGNITION AND PREVENTION

2.3.1 Recognition

Foreseeable emergency situations that may be encountered during site activities will generally be recognizable by visual observation. A clear knowledge of the signs and symptoms of overexposure to contaminants of concern may alert personnel of the potential hazards concerning themselves or their fellow workers. These potential hazards, the activities with which they have been associated, and the recommended control methods are discussed in detail in Sections 5.0 and 6.0 of this document. Additionally, early recognition will be supported by periodic site surveys to eliminate any conditions that may predispose site personnel or properties to an emergency. The FOL and the SSO will constitute the site evaluation committee responsible for these periodic surveys. Site surveys will be conducted at least once a week during the initiation of this effort.

The above actions will provide early recognition for potential emergency situations. Should an incident take place, TtNUS will take defensive and offensive measures to control these situations. However, if the FOL and/or the SSO determine that an incident has progressed to a serious emergency situation, TtNUS will withdraw, and notify the appropriate response agencies.

2.3.2 Prevention

TtNUS and subcontractor personnel will minimize the potential for emergencies by ensuring compliance with the HASP, the Health and Safety Guidance Manual, applicable OSHA regulations, and through periodic site surveys of work areas.

2.4 SAFE DISTANCES AND PLACES OF REFUGE

In the event that the site must be evacuated, all personnel will immediately stop activities and report to the FOL at the place of safe refuge. Safe places of refuge will be determined prior to commencement of site activities and will be conveyed to personnel as part of the daily safety meeting conducted each morning. Upon reporting to the refuge location, personnel will remain there until directed otherwise by the TtNUS FOL. The FOL or the SSO will take a head count at this location to confirm the location of all site personnel. The site logbook will be used to take the head count. Places of refuge will ideally be selected which offer a point for communication purposes should this be required.

2.5 EVACUATION ROUTES AND PROCEDURES

Once an evacuation is initiated, personnel will proceed immediately to the designated place of refuge, unless doing so would further jeopardize the welfare of workers. In such event, personnel will proceed to a designated alternate location (to be identified) and remain there until further notification from the FOL. The use of these locations as assembly points provides communication and a direction point for emergency services, should they be needed.

Evacuation procedures will be discussed prior to the initiation of any work at the site. This shall include identifying primary and secondary evacuation routes and assembly points. Evacuation routes from the site are dependent upon the location at which work is being performed and the circumstances under which an evacuation is required. Additionally, site location and meteorological conditions (i.e., wind speed and direction) will influence the designation of evacuation routes. As a result, assembly points at NWIRP will be selected, and in the event of an emergency, field personnel will proceed to these points by the most direct route possible without further endangering themselves.

2.6 EMERGENCY ALERTING AND ACTION/RESPONSE PROCEDURES

Since TtNUS personnel may not always be working in the proximity of each other, hand signals, voice commands, air horns, and two-way radios will comprise the mechanisms to alert site personnel of an emergency.

If an incident occurs, site personnel will initiate the following procedures:

- Initiate incident alerting procedures (if needed) verbally, by air horn, or using two-way radios.
- Evacuate non-essential personnel.
- Initiate incipient response procedures.
- Describe to the FOL (who will serve as the Incident Commander) what has occurred in as much detail as possible.

In the event that site personnel cannot control the incident through offensive and/or defensive measures, the FOL and/or the SSO will enact emergency notification procedure to secure additional outside assistance in the following manner:

- Contact 911 to report the incident (see Table 2-1). Give the emergency operator the location of the emergency, the type of emergency, the number of injured, and a brief description of the incident. Stay on the phone and follow the instructions given by the operator. The operator will then notify and dispatch the proper emergency response agencies.

If an incident occurs at NWIRP outside of designated operating areas impacting field personnel, the following procedures are to be initiated:

- Initiate an evacuation (if needed) by voice commands, hand signals, air horns, or two-way radio.
- Call Navy On-Site Representative
- Proceed to the assembly points as directed by NWIRP personnel.

2.7 EMERGENCY CONTACTS

Prior to initiating field activities, all personnel will be thoroughly briefed on the emergency procedures to be followed in the event of an accident. Table 2-1 provides a list of emergency contacts and their associated telephone numbers. This table must be posted where it is readily available to all site personnel. Facility maps should also be posted showing potential evacuation routes and designated meeting areas.

**TABLE 2-1
EMERGENCY CONTACTS
NWIRP CALVERTON**

AGENCY	TELEPHONE
EMERGENCY (Police, Fire, and Ambulance Services)	911
Riverhead Police	(631) 797-4500
Manorville Fire Department (Emergency)	(631) 924-5252
(Business)	(631) 868-6614
Central Suffolk Hospital in Riverhead	(631) 548-6000
Long Island Regional Poison Control Center	(516) 542-2323
NWIRP Calverton Point of Contact Al Taormina	(516) 346-0344
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
Tetra Tech NUS, Pittsburgh Office	(412) 921-7090
Project Manager David D. Brayack, P.E.	(412) 921-8375
CLEAN Health and Safety Manager Matthew M. Soltis, CIH, CSP	(412) 921-8912
Project Health & Safety Officer Donald J. Westerhoff, CSP	(412) 921-7281
Navy Remedial Project Manager (RPM) Jim Colter	(610) 595-0567 ext. 163

2.8 EMERGENCY ROUTE TO HOSPITAL

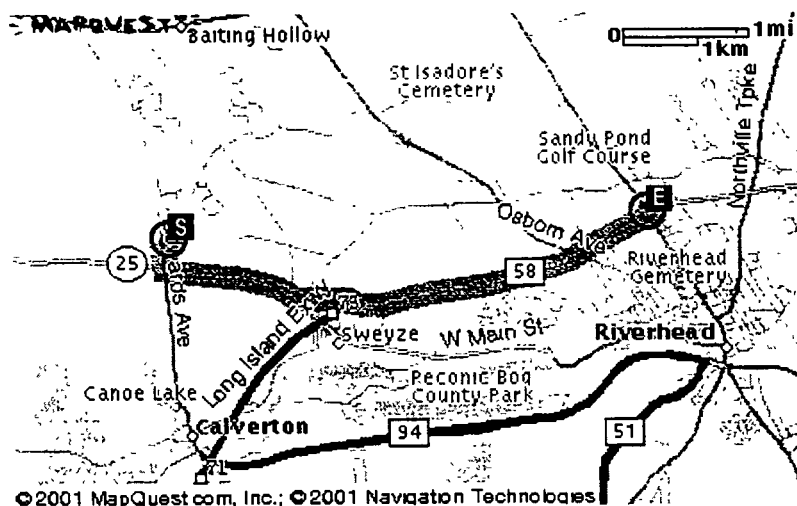
Central Suffolk Hospital
1300 Roanoke Avenue
Riverhead, New York 11901

Directions to the Central Suffolk Hospital:

Proceed to the north gate and turn right traveling east on Route 25 (Middle County Road). Route 25 turns into Route 58. Proceed to traffic circle. The hospital is on the left and is approximately 10 minutes away from the site.

See Figure 2-1 for map to Central Suffolk Hospital.

FIGURE 2-1
Route to Central Suffolk Hospital



2.9 DECONTAMINATION PROCEDURES/EMERGENCY MEDICAL TREATMENT

During any site evacuation, decontamination procedures will be performed only if doing so does not further jeopardize the welfare of site workers. Decontamination will not be performed if the incident warrants immediate evacuation. However, it is unlikely that an evacuation would occur which would require workers to evacuate the site without first performing the necessary decontamination procedures.

TtNUS personnel will perform removal of personnel from emergency situations and may provide initial medical support for injury/illnesses requiring only first-aid level support. Medical attention above that level will require assistance and support from the designated emergency response agencies. **If the emergency involves personnel exposures to chemicals, follow the steps provided in Figure 2-2.**

2.10 INJURY/ILLNESS REPORTING

If any TtNUS personnel are injured or develop an illness as a result of working on site, the TtNUS "Injury/Illness Procedure" (Attachment I) must be followed. Following this procedure is necessary for documenting all of the information obtained at the time of the incident. Also, as soon as possible Navy Contact Jim Colter must be informed of any incident or accident that requires medical attention.

Any pertinent information regarding allergies to medications or other special conditions will be provided to medical services personnel. This information is listed on Medical Data Sheets filed onsite. If an exposure to hazardous materials has occurred, provide information on the chemical, physical, and toxicological properties of the subject chemical(s) to medical service personnel.

FIGURE 2-2 EMERGENCY RESPONSE PROTOCOL

The purpose of this protocol is to provide guidance for the medical management of injury situations.

In the event of a personnel injury or accident:

- Rescue, when necessary, employing proper equipment and methods.
- Give attention to emergency health problems -- breathing, cardiac function, bleeding, and shock.
- Transfer the victim to the medical facility designated in this HASP by suitable and appropriate conveyance (i.e. ambulance for serious events)
- Obtain as much exposure history as possible (a Potential Exposure report is attached).
- If the injured person is a Tetra Tech NUS employee, call the medical facility and advise them that the patient(s) is/are being sent and that they can anticipate a call from the WorkCare physician. WorkCare will contact the medical facility and request specific testing which may be appropriate. WorkCare physicians will monitor the care of the victim. Site officers and personnel should not attempt to get this information, as this activity leads to confusion and misunderstanding.
- Call WorkCare at 1-800-455-6155 enter Extension 109, or follow the voice prompt for after hours and weekend notification, and be prepared to provide:
 - Any known information about the nature of the injury.
 - As much of the exposure history as was feasible to determine in the time allowed.
 - Name and phone number of the medical facility to which the victim(s) has/have been taken.
 - Name(s) of the involved Tetra Tech NUS, Inc. employee(s).
 - Name and phone number of an informed site officer who will be responsible for further investigations.
 - Fax appropriate information to WorkCare at (714) 456-2154.
- Contact Corporate Health and Safety Department (Matt Soltis) at 1-800-245-2730.

As data is gathered and the scenario becomes more clearly defined, this information should be forwarded to WorkCare.

WorkCare will compile the results of all data and provide a summary report of the incident. A copy of this report will be placed in each victim's medical file in addition to being distributed to appropriately designated company officials.

Each involved worker will receive a letter describing the incident but deleting any personal or individual comments. A personalized letter describing the individual findings/results will accompany this generalized summary. A copy of the personal letter will be filed in the continuing medical file maintained by WorkCare.

FIGURE 2-2 (continued)
WORKCARE
POTENTIAL EXPOSURE REPORT

Name: _____ Date of Exposure: _____
Social Security No.: _____ Age: _____ Sex: _____
Client Contact: _____ Phone No.: _____
Company Name: _____

I. Exposing Agent

Name of Product or Chemicals (if known): _____

Characteristics (if the name is not known)

Solid Liquid Gas Fume Mist Vapor

II. Dose Determinants

What was individual doing? _____
How long did individual work in area before signs/symptoms developed? _____
Was protective gear being used? If yes, what was the PPE? _____
Was their skin contact? _____
Was the exposing agent inhaled? _____
Were other persons exposed? If yes, did they experience symptoms? _____

III. Signs and Symptoms (check off appropriate symptoms)

Immediately With Exposure:

Burning of eyes, nose, or throat
Tearing
Headache
Cough
Shortness of Breath

Chest Tightness / Pressure
Nausea / Vomiting
Dizziness
Weakness

Delayed Symptoms:

Weakness
Nausea / Vomiting
Shortness of Breath
Cough

Loss of Appetite
Abdominal Pain
Headache
Numbness / Tingling

IV. Present Status of Symptoms (check off appropriate symptoms)

Burning of eyes, nose, or throat
Tearing
Headache
Cough
Shortness of Breath
Chest Tightness / Pressure
Cyanosis

Nausea / Vomiting
Dizziness
Weakness
Loss of Appetite
Abdominal Pain
Numbness / Tingling

Have symptoms: (please check off appropriate response and give duration of symptoms)
Improved: _____ Worsened: _____ Remained Unchanged: _____

V. Treatment of Symptoms (check off appropriate response)

None: _____ Self-Medicated: _____ Physician Treated: _____

3.0 SITE BACKGROUND

The NWIRP Calverton is located approximately 70 miles east of New York City on the eastern end of Long Island, in Suffolk County, New York. It covers almost 6,000 acres, with a portion in the town of Riverhead and the remaining land in Brookhaven.

NWIRP Calverton has been owned by the United States Navy since the early 1950's, at which time the land was purchased from a number of private owners. It was used for the development, assembly, testing, refitting, and retrofitting of Naval combat aircraft. The facility was expanded in 1958 through additional purchases of privately-owned land. Northrop Grumman Corporation (previously Grumman Corporation) leased the land and was the sole operator of the facility from its construction until February 1996. In 1996, the land was returned to the United States Navy. In 1998, the majority of the facility was transferred to the Town of Riverhead.

The majority of industrial activity at the facility was confined to the developed area in the center and south center of the facility, between the two runways. Industrial activities at the facility were related to the manufacturing and assembly of aircraft and aircraft components. Operations which resulted in hazardous waste generation, included but were not limited to, metal finishing processes such as metal cleaning and electroplating, other maintenance operations, temporary storage of hazardous waste, fueling operations, and various training operations. The painting of aircraft and components resulted in additional waste generation.

3.1 SITES DESCRIPTION

3.1.1 Site 6A - Fuel Calibration Area

The Fuel Calibration Area is located in the south central portion of the facility. The fuel calibration and related facilities were used in the testing of aircraft fuel and engine systems. Aircraft fuel delivery systems were pressurized with fuel in the calibration area to test for leaks. The testing may have resulted in frequent, small fuel spills to the area's pavement.

The Fuel Calibration Area consists of a new and old fuel calibration pad, as well as surrounding impacted areas. The old fuel calibration pad was located in what is now an open grass-covered field. The new fuel calibration pad is located to the north and east of the old fuel calibration pad on concrete apron. The concrete apron between the two fuel calibration pads was also used for the same activity. A shed, piping, and fuel filtering devices were still located in the 1980s. The equipment has since been removed.

The open field, approximately 10 acres in area, is located immediately south of the old and new calibration pads and is included as part of Site 6A. The old fuel calibration pad was located at the northwestern corner of the field, in an area now partially covered by a wastewater treatment facility. No physical evidence exists of the former calibration area. An area east of the wastewater treatment plant and south of the fuel pad is the former site of a leach field.

The Fuel Calibration Area is sloped very gently to the south and east. Drainage swales are located parallel to the southern and eastern edges of the pad. The two swales meet east of the south corner of the pad, and enter a southward trending buried culvert. The culvert outfalls to another drainage ditch approximately 625 feet south of the pad. The ditch continues to a shallow pond located approximately 1,500 south-southwest of the pad. Aircraft hangers and painting shops are located east of the pad. Several small drainage collection ponds are located to the north, east, and south of the Fuel Calibration Area, all within 1,500 feet.

Three ancillary structures to the Fuel Calibration Area are located to the southeast. These include the covered engine runup area, the hush house, and the Engine Test House (Site 10 B). An excavated area, several acres in size, is located east of the engine runup area blast fence.

3.1.2 Site 2 – Fire Training Area

Site 2 is located on the eastern side of a 9-acre clearing in the south-central portion of NWIRP Calverton. A circular, concrete pit in the southeast corner of the clearing was used to contain liquids for fire training exercises. The pit is approximately 50 feet in diameter. A 1,000-gallon steel aboveground storage tank located approximately 75 feet north of the training area was used to store fuel. This tank was removed in 1996. A 6,000-gallon underground fuel storage tank was located north of the training area before 1982. The eastern portion of the fire training area was partially excavated at an unknown time. A small embankment up to 4 feet high is located along the eastern edge of the area, and a dirt access road is located along the southern edge. Vegetation covers the majority of the area within the clearing west of the concrete pit. The fire training area is surrounded by woodlands.

Before 1982, activities at the site consisted of clearing an area up to 100 feet or more in diameter and creating an earthen berm to surround the area. The bermed area was filled with a layer of water. Waste fuels, oils, and solvents were floated on the water and ignited. Aircraft sections were sometimes placed in the area to simulate crash conditions. After 1975, waste solvents were reportedly no longer mixed with the waste fuel and oil. The curbed, concrete pit was constructed in 1982, and the use of earthen berms was discontinued. Fire fighting materials included aqueous fire fighting foam, gaseous Halon 1301, water, and dry chemical extinguishers.

To date, remedial activities consisted of spill cleanup, removal of storage tanks and contaminated soil, installation of a free product removal, and installation of a pilot-scale air sparging/soil vapor extraction (AS/SVE) system. A spill of unknown volume originated from the 6,000-gallon storage tank in August 1982. Approximately 327 cubic yards of contaminated soil were removed from the tank and spill area, monitoring wells were installed, the concrete pit was constructed, and the 1,000-gallon tank was installed.

In 1983, approximately 300 gallons of waste oil leaked from the pipeline leading from the 1,000-gallon tank. Additional monitoring wells were installed to track potential contamination from the spills.

A groundwater recovery system was installed in December 1987. This system consisted both of an active and a passive recovery system. The active recovery system included a groundwater pumping well, an oil recovery well, and an oil water separator tank. The passive recovery system consisted of hydrophobic filters located in shallow wells. The active recovery system was shut down in 1993. Passive free product recovery continued until 1996. As of December 1996, approximately 325 gallons of petroleum product have been removed from this site. In 2000, a passive recovery system, using adsorbent media, was initiated.

A pilot-scale AS/SVE system was installed in 1995. As of 2000, approximately 80 pounds of volatile organic compounds (VOCs) had been removed. In addition, an estimated 30,000 pounds of organics have been destroyed through biodegradation. VOC concentrations in soil and groundwater have been reduced by 70 to 95 percent.

4.0 SCOPE OF WORK

The following is a list of activities that are covered in this HASP to be conducted under CTO 0223.

- Mobilization/demobilization
- Excavation activities
 - **Site 6A** – One or two trenches will be excavated (less than 5 feet deep, 20 to 50 feet long). The intent is to determine what impact seasonal changes have on the accumulation of free product under the surface. Two subsurface soil samples will be collected from the excavation. Potentially contaminated soils (determined based on odor or elevated PID readings) will be segregated and stockpiled separately from other uncontaminated soils.
 - **Site 2** – Two or three trenches (approximately 15 feet deep) will be excavated. Portions of the existing AS/VE system may need to be disassembled to enable excavation activities to be conducted. Two subsurface soils samples will be collected from the excavation (collected from the backhoe – no personnel will be permitted to enter the excavation). Potentially contaminated soils (determined based on odor or elevated PID readings) will be segregated and stockpiled separately from other uncontaminated soils. The excavation will be backfilled after the soils are collected.
- Collection of a total of four subsurface soil samples from excavated soils.
- Decontamination of sampling and heavy equipment

For more detailed description of the associated tasks, refer to the Work Plan (WP) and/or Sampling and Analysis Plan (SAP). Any tasks to be conducted outside of the elements listed here will be considered a change in scope requiring modification of this document. The PM or a designated representative will submit all requested modifications to this document to the HSM.

5.0 TASKS/HAZARDS/ASSOCIATED CONTROL MEASURES SUMMARIZATION

Table 5-1 of this section serves as the primary portion of the site-specific HASP which identifies the tasks that are to be performed as part of the scope of work. This table will be modified and incorporated into this document as new or additional tasks are performed at the site. The anticipated hazards, recommended control measures, air-monitoring recommendations, required Personal Protective Equipment (PPE), and decontamination measures for each site task are discussed in detail. This table and the associated control measures shall be changed, if the scope of work, contaminants of concern, or other conditions change.

Through using the table, site personnel can determine which hazards are associated with each task and at each site, and what associated control measures are necessary to minimize potential exposure or injuries related to those hazards. The table also assists field team members in determining which PPE and decontamination procedures to use based on proper air monitoring techniques and site-specific conditions.

As discussed earlier, the Health and Safety Guidance Manual supports this table and HASP. The manual is designed to further explain supporting programs and elements for other site-specific aspects as required by regulatory requirements. The Guidance Manual should be referenced for additional information regarding air monitoring instrumentation, decontamination activities, emergency response, hazard assessments, hazard communication and hearing conservation programs, medical surveillance, PPE, respiratory protection, site control measures, standard work practices, and training requirements. Many of TtNUS' SOPs are also provided in this Guidance Manual.

Safe Work Permits issued for all Exclusion Zone activities (See Section 9.4 and Attachment IV) will use elements defined in Table 5-1 as the primary reference. The FOL or the SSO completing the Safe Work Permit will add additional site-specific information. In situations where the Safe Work Permit is more conservative than the direction provided in Table 5-1, the Safe Work Permit will be followed. As the project develops and more information is gained, the SSO will modify the Safe Work Permits to reflect this information.

TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES – SITE 6A & 2, NWIRP, CALVERTON, NY

Revision 0

Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring Types and Action Levels	Personal Protective Equipment (Items in <i>italics></i> are deemed optional as conditions or the FOL or SSO dictate.)	Decontamination Procedures
<p>Mobilization/Demobilization</p> <p>This activity includes, but not limited to</p> <p>Equipment Preparation and Evaluation</p> <p>Resource acquisition and unpacking of supplies</p> <p>Site clearance and preparation – Utility clearances, etc</p> <p>Establish and construct access routes to sample/work locations</p> <p>Construct decontamination and storage facilities, as applicable.</p>	<p>Chemical hazards:</p> <p>1) The on-site Hazard Communication Program (Section 5.0 TiNUS Health and Safety Guidance Manual) will be followed. All chemicals brought onto the site by Tetra Tech NUS and subcontractor personnel will be inventoried with each applicable chemical having an MSDS on site, on file. This effort shall include:</p> <p>Accurate Chemical Inventory List (Entries will match chemicals brought on-site, as the names appear on the MSDS and the label)</p> <p>MSDS's will be maintained in a central location, accessible to all personnel</p> <p>All containers will have labels specifying the following information:</p> <ul style="list-style-type: none">- Chemical Identity (As it appears on the label, MSDS, and Chemical Inventory List)- Appropriate Warning (i.e., Eye and skin irritation, flammable, etc.)- Manufacturer's Name, Address and Phone Number <p>It will be the FOL and/or the SSO's responsibility to insure this is completed</p> <p>Physical hazards:</p> <p>2) Lifting (strain/muscle pulls)</p> <p>3) Cuts and lacerations</p> <p>4) Pinches and compressions/Struck by</p> <p>5) Slips, trips, and falls</p> <p>6) Heavy equipment hazards (swinging booms, hydraulic lines, etc.)</p> <p>7) Vehicular and foot traffic</p> <p>Natural hazards:</p> <p>8) Ambient temperature extremes (heat/cold stress)</p> <p>9) Insect and animal bites and poisonous plants</p> <p>10) Inclement weather</p>	<p>Chemical hazards:</p> <p>1) All personnel will be required to review the appropriate MSDS's, prior to the use of a specified chemical substance. This direction should also be communicated on the Safe Work Permit completed for this task. Any specific provisions recommended by the MSDS shall be in place (i.e., eye wash, fire extinguisher, specified PPE, etc.) prior to using the chemical substance.</p> <p>Physical hazards:</p> <p>2) Lifting Hazards – During mobilization/demobilization personnel are required to handle equipment, supplies, and resources in preparation for site activities. The following provisions shall be instituted in order to minimize hazards of this nature:</p> <ul style="list-style-type: none">- Use machinery or multiple personnel for heavy lifts- Use proper lifting techniques- Lift with your legs, not your back; bend your knees; move as close to the load as possible, and ensure good hand holds are obtainable- Minimize the horizontal distance to the center of the lift to your center of gravity- Minimize turning and twisting when lifting as the lower back is especially vulnerable at this time- Break lifts into steps if the vertical distance (from the start point to the placement of the lift) is excessive- Plan your lifts – Place heavy items on shelves between the waist and chest; lighter items on higher shelves- Periods of high frequency lifts or extended duration lifts should provide sufficient breaks to guard against fatigue and injury <p>In determining whether you can lift an item, several factors must be considered; these are as follows:</p> <p>Maximum weight lifted by a single person should not exceed 70 pounds. Items over 70 pounds or the amount you feel you can confidently lift up to 70 pounds should define the point where assistance in the lift is sought.</p> <p>Other considerations defining lifting hazards:</p> <ul style="list-style-type: none">- Area available to maneuver the lift- Area of the lift – Work place clutter, slippery surfaces- Your Overall physical condition <p>3) Cuts and lacerations – To prevent cuts and lacerations associated with unpacking or packing equipment and supplies, during site preparation (clearing access routes), the following provisions are required:</p> <ul style="list-style-type: none">- Always cut away from yourself and others- Do not place items to be cut in your hand or on your knee- Change out blades as necessary to maintain a sharp cutting edge. Many accidents result from struggling with dull cutting attachments <p>If hand tools (brush hooks, machetes, etc.) are used to gain access to sample locations, the following precautions are recommended:</p> <ul style="list-style-type: none">- Insure handles are of good construction (no cracks, splinters, loose heads/cutting apparatus)- Insure all cutting tools are maintained. Blades shall be sharp without knicks and gouges in the blade- All hand tools (brush hooks, machetes, etc.) with cutting blades shall be provided with a sheath- All personnel will maintain a 10-foot perimeter or greater around persons clearing brush and access paths to sample and/or well locations <p>4) Pinches/Compressions/Struck By - Do not modify tooling without manufacturer's expressed permission</p> <ul style="list-style-type: none">- Keep any machine guarding in place, avoid moving parts- Use tools or equipment where necessary to avoid placing hands in areas vulnerable to pinch points.- Adjust machine guarding as necessary to minimize distance between guards and point of operation- When staging equipment, insure all stacked loads, shelving, are adequately secure to avoid creating a hazard from falling objects <p>5) Preview work locations for unstable/uneven terrain.</p> <ul style="list-style-type: none">- Cover, guard and barricade all open pits, ditches, and floor opening, as necessary- Fences shall be constructed to control and isolate traffic in the work area and to isolate resource or staging areas- The FOL and the SSO during site surveys and site preparation should identify these potential hazards- All activities conducted greater than 6-feet above ground surface shall employ acceptable engineered fall protection (i.e., handrails and platforms) or accepted fall protection harnesses <p>6) Heavy Equipment Hazards - All equipment will be:</p> <ul style="list-style-type: none">- Inspected in accordance with OSHA and manufacturer's design- All equipment inspection will be documented on a Equipment Inspection Checklist as provided in Attachment III- Operated by knowledgeable operators and ground crew. <p>7) Vehicular and Foot Traffic Hazards - As part of site preparation activities and zone construction, when preparing traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none">- Establish safe zones of approach (i.e., Boom or mast + 5 feet)- Foot and vehicular traffic routes shall be well defined- Heavy equipment patterns shall be isolated using fences or other suitable barricades from pedestrian pathways- Bumpers or other suitable traffic stops shall be placed in areas where it is desired that traffic approaching an open excavation stops- All self-propelled equipment shall be equipped with movement warning systems- The FOL and/or the SSO shall preview traffic routes (foot and vehicular) before the commitment of personnel and resources <p>Natural hazards:</p> <p>8) Ambient Temperature Extremes - Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat and cold stress is provided in Section 4.0 of the TiNUS Health and Safety Guidance Manual.</p> <p>9) Insect/Animal Bites and Stings and Poisonous Plants - To combat the potential impact of natural hazards, the following actions are recommended:</p> <ul style="list-style-type: none">- Avoid nesting – Preview routes, avoid nests, if at all possible- Wear light color clothes. This will allow easier detection of ticks and insects crawling on your body. It will also assist in heat stress control- Tape pant legs to work boots to block direct access- Use repellents – Permethrin should be applied liberally to the clothing, but not the skin as it may cause irritation. Concentrate on areas where ticks and other insects may access your body such as pant cuffs, shirt to pants, and collars- If clearing access routes to sample locations in potential snake infested areas, personnel are recommended to wear snake chaps, as a precaution. For larger animals and reptiles, post a safety watch.- Report potential hazards to the SSO- As this activity may take personnel into areas of heavier vegetation, personnel should be cognizant of poison ivy, poison oak, and poison sumac in the area. See Section 6.3 for descriptions of these plants. Protective measures to be used to minimize hazards of this nature:<ul style="list-style-type: none">a) Avoid direct contact through the use of Tyvek coveralls, clothing, or barrier creamsb) Wash after contact with cool water and mild soapc) Wash equipment contaminated with the oils of these plants to avoid cross contamination <p>10) Inclement Weather - Suspend or terminate operations until directed otherwise by SSO. See Section 4.0 of the TiNUS Health and Safety Guidance Manual for additional information concerning natural hazards.</p>	<p>Visual observation of work practices by the FOL and/or the SSO to minimize potential physical hazards (i.e., improper lifting, unsecured loads, cutting practices, etc.)</p>	<p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none">- Standard field attire (Sleeved shirt, long pants)- Steel toe safety shoes- Safety glasses- Hardhat (when overhead hazards exist, or identified as a operation requirement)- Reflective vest for high traffic areas- Hearing protection for high noise areas (As directed on an operation by operation scenario or at the direction of the FOL and/or the SSO). <p>As site conditions may change, the following equipment will be maintained during all on-site activities as prescribed in Section 2.0 of this HASP:</p> <ul style="list-style-type: none">- Fire Extinguishers- First-aid kit <p>Note: The FOL and/or the SSO shall determine the number of fire extinguishers and first-aid kits to be made available based on the number of remote or separated operations to be conducted at any given time.</p>	<p>Not required</p> <p>Good personal hygiene practices should be employed prior to breaks, lunch or other period when hand to mouth contact occurs. This will minimize potential ingestion exposures.</p> <p>Site Preparation – A structured decontamination is not required for this activity. However, as some site preparation activities may require personnel to enter unimproved areas (heavy underbrush, wooded areas), personnel should inspect themselves and one another for the presence of ticks when exiting wooded areas, grassy fields, etc. This action will be employed to assist in stopping the transfer of these insects into vehicles, homes, and offices.</p>

TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES –SITE 6A & 2, NWIRP, CALVERTON, NY

Revision 0

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment (Items in <i>italics</i> are deemed optional as conditions or the FOL or SSO dictate.)	Decontamination Procedures
<p>Excavation of Test Pits</p> <p>This activity will also support back-filling, compaction, and any site restoration efforts</p> <p>Each piece of equipment operating shall be supported by a designated ground spotter and the operator</p>	<p>Chemical hazards:</p> <p>1) Previous analytical data identified VOCs associated with fuels and solvents as the primary contaminants of concern. Specifically, at Site 6A, xylene, 1,1-dichloroethane, chloroethane, 1,1,1-trichloroethane, and tetrachloroethylene were identified as VOCs that could present an exposure hazard if work was performed within excavations. At Site 2, chloroethane was the only VOC that could present an exposure hazard if work was performed within the excavation.</p> <p>However, since workers will not be permitted to enter any excavations, it is not anticipated that any of these chemicals are present at sufficient concentrations that are capable of causing an exposure hazard to personnel working in the area of excavations.</p> <p>Further information on these contaminants are presented in Table 6-1.</p> <p>2) Transfer of contamination into clean areas or onto persons</p> <p>Physical hazards:</p> <p>3) Heavy equipment/machinery hazards (moving equipment, struck by hazards, etc.)</p> <p>4) Collapse of the excavation</p> <p>5) Energized systems (contact with underground or overhead utilities)</p> <p>6) Noise in excess of 85 dBA</p> <p>7) Vehicular and equipment traffic</p> <p>8) Strain from heavy lifting</p> <p>9) Slips, trips, and falls</p> <p>Natural hazards:</p> <p>10) Inclement weather/Heat Stress</p>	<p>Chemical hazards:</p> <p>1) As a general rule, avoiding contact with free product and potentially contaminated media (air, water, soils, etc.) will be employed as a universal control measure. A Photoionization Detector (PID) will be used to evaluate airborne concentrations at source (excavated soils) and worker breathing zone areas. The PID will also be used to segregate contaminated soil from clean soil. The chemicals of concern are not anticipated to present a significant exposure hazard to site personnel. However, airborne concentrations of site contaminants may accumulate in excavations and present a more significant hazard if personnel were to enter them. However, personnel will not be permitted to enter open excavations. It is possible that free product may be encountered during excavation activities. Avoiding contact with free product and potentially contaminated media will be minimized through the use of administrative controls and the use of PPE.</p> <p>Significant amounts of dust (airborne particulates) are not anticipated to be generated during site activities. However, if airborne dusts are observed area wetting methods or other controls (avoiding dust plumes, moving operations upwind, etc.) will be used to prevent potential exposure to contaminants that may be bound to these particulates.</p> <p>2) Restrict the cross use of equipment and supplies between locations and activities without first going through a suitable decontamination. Work practices including:</p> <ul style="list-style-type: none">- Excavating from the furthest point on the pit location/site and working out will minimize tracking contaminated materials over clean areas.- A rigid decontamination procedure at the excavation pit locations will ensure materials are not carried and deposited in unaffected areas.- Restriction of non-essential vehicles will be used to minimize the spread of this material during transportation into unaffected areas.- Excavated materials should be segregated. Odor and PID readings will be used to segregate the soils. Contaminated media will be placed on polyethylene sheeting away from the rest of the materials to be removed. The remainder should be placed on polyethylene sheeting in a separate pile which will be used to backfill. <p>Physical hazards:</p> <p>3) All equipment to be employed will be:</p> <ul style="list-style-type: none">- Inspected in accordance with Federal safety and transportation guidelines, OSHA (1926.600, 601, 602), and manufacturer's design, and documented as such using Equipment Inspection Checklist provided as Attachment III. Complete the Equipment Inspection Checklist for each piece of equipment used at the site.- Equipment operation will be conducted by knowledgeable operators and coordinated by experienced ground crew, as applicable.- Used within safe work zones, with routes of approach clearly demarcated. All personnel not directly supporting this operation will remain at least the length of a fully extended boom + 5-feet with a minimum distance of 25-feet from the point of operation. This will be the area identified as the exclusion zone. <p>In addition to equipment considerations, the following safe operating procedures will be incorporated:</p> <ul style="list-style-type: none">- Only manufacturer-approved equipment may be used in conjunction with equipment repair procedures (e.g., lifting attachments, etc.).- Work areas will be kept clear of clutter and unnecessary personnel.- All self-propelled equipment shall be equipped with movement warning systems.- See additional safe work procedures for excavation activities in Section 6.0 of this HASP. <p>4) All excavations shall be in conformance with requirements established under 29 CFR 1926.650 - 652 concerning sloping, shoring, storage, and movement on and over and around trenches and excavations.</p> <ul style="list-style-type: none">- No personnel associated with this field effort will enter any excavations.- All supplies, clean fill, vehicular traffic will be maintained at a minimum distance of 10 feet from the excavation until soil classification can be determined or side-wall restraining devices are employed.- Excavations will not proceed any closer than 6 feet to any foundation, footer, and/or support base.- If necessary, the teeth of the bucket will have a flat bar or cutting bar attached to the teeth also known as a sand bar to prevent the teeth of the backhoe from snagging any undetected utility.- Site control during excavation will be accomplished through the use of barricade tape and weighted poles and signs indicating excavation in progress. <p>5) All utility clearances shall be obtained prior to any excavation activities. All excavation activities will proceed in accordance with the Utility Locating and Excavation Clearance SOP in Attachment IV of this HASP. All utility clearances will be obtained, in writing, and locations identified and marked prior to activities. See Attachment Where the utility clearance cannot be obtained in a reasonable period, or not located, excavations shall proceed with extreme caution and proceed using cable and piping locators and other geophysical detection methods to avoid utility damage.</p> <p>6) Hearing protection will be used during all subsurface activities using the excavator when noise levels are > 85 dBA (during operation). Boundaries will be established to limit noise hazard. Length of the boom + 5 feet or a minimum of 25 feet is normal. Excessive noise levels are being approached when you have to raise your voice to talk to someone within 2 feet of your location.</p> <p>7) Traffic and equipment considerations are to include the following:</p> <ul style="list-style-type: none">- Establish safe zones of approach (i.e., Boom + 5 feet).- All equipment shall be equipped with movement warning systems.- Employ safety belts and follow the site traffic rules. <p>8) Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques. See mobilization/demobilization for lifting recommendations.</p> <p>9) Preview work locations for unstable/uneven terrain. The following additional provisions shall be employed to minimize hazards of this nature:</p> <ul style="list-style-type: none">- Avoid working/walking too close to excavation and other areas of unsure footing. A Minimum distance of 3-feet for pedestrian pathways should be maintained from excavation edges.- Backfilling activities should proceed in 1-foot lifts and allow compaction with the bucket. Improper/inadequate compaction may result in areas settling and creating trip and fall hazards.- Ruts, roots, and other tripping hazards should be eliminated approaching excavation edges should be minimized to the extent possible to avoid trips and falls when approaching excavation edges or boundaries.- Maintain a clutter free work area.	<p>Air monitoring will be conducted to evaluate potential airborne concentrations at source areas (excavated dirt, liquids, etc.) and at worker breathing zones. Source area monitoring will be used to determine the presence of site contaminants and to assess potential impact to site workers. Observations of elevated readings at a source area will require workers' breathing zones to be monitored to evaluate potential exposures and to determine appropriate course of action to ensure their protection.</p> <p>Air monitoring will be conducted using a PID with a 10.6 eV lamp source and will be required during excavation and sampling activities. During soil screening, odor and elevated PID readings will be used to segregate contaminated soils from clean soils. Once elevated PID readings are observed, worker breathing zones will be evaluated and compared to the following action levels:</p> <ul style="list-style-type: none">• Background readings: Continue working, perform monitoring periodically (concentrating on workers closest to the point of operation/source area of elevated PID reading) or whenever a change in source area readings is noted.• < 10 ppm (sustained readings > 1 minute in duration): Perform continuous monitoring in worker breathing zones. Evaluate if controls can be used to reduce potential exposures (move operations upwind, cover stockpiles, etc.).• 10 ppm – suspend site operations and notify the PHSO or HSM for further direction (determining the source, identifying the contaminant, initiating controls, etc.). <p>NOTE:</p> <ul style="list-style-type: none">• Although none of the chemicals of concern are anticipated to present an exposure hazard, the Action Levels have been conservatively based on xylene – the chemical constituent most likely to be present and detected by a PID. Other contaminants of concern are not anticipated to be the source of elevated PID readings.• All action levels are based on observed concentrations in worker breathing zones. <p>An LEL/O2 meter will be available at the site to evaluate LEL concentrations of any free product that is encountered during the excavations or site operations. It is not anticipated that monitoring with the LEL/O2 will be required for exposure monitoring purposes. Nor is it anticipated that dangerous LEL concentrations (>10 %) or O2 levels (< 19.5 % or > 23.5%) will be observed during any site operations. If such conditions are found to exist, contact the PHSO or the HSM.</p> <p>Significant dust or airborne particulates are not anticipated to be generated during this activity. So no monitoring activities have been recommended. However, if airborne dusts are observed, appropriate control measures will be implemented (area wetting methods, moving operation upwind, avoiding dust plumes, etc.).</p>	<p>All excavation operations will be initiated in Level D protection, including the following articles:</p> <p>Ground Spotter/Sampler</p> <ul style="list-style-type: none">- Standard field dress (long pants, sleeved shirts)- Steel toe safety shoes or work boots- Hard hat- Impermeable boot covers (if muddy conditions or contact with contaminated media exists)- Hearing Protection- Reflective or Orange Blaze Vest- <i>Tyvek or washable cotton coveralls</i> <p>The Ground Spotter shall direct all activities of the operator. The operator shall follow only the directions given by the designated ground spotter.</p> <p>Hand signals, radios, or selected means of communication will be determined by the ground spotter and operator, prior to beginning any excavation activities.</p> <p>Operator</p> <ul style="list-style-type: none">- Standard field dress (long pants, sleeved shirts)- Steel toe safety shoes or work boots- Hard hat (Not required for closed cabs)- Hearing Protection (As directed by the SSO)- Seat Belt <p>Each piece of heavy equipment and all vehicles greater than 1-ton rating shall be fitted with a fire extinguisher Type ABC 2 1/2 pound rating.</p> <p>Note: The Safe Work Permit(s) for this task (Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p> <p>As site conditions may change, the following equipment will be maintained during all on-site activities:</p> <ul style="list-style-type: none">- Fire Extinguishers- First-aid Kit	<p>Personnel Decontamination – This decontamination procedure for Level D protection will consist of:</p> <ul style="list-style-type: none">- Equipment drop- Soap/water wash and rinse of outer boots,- Removal of outer Boots/Boot covers, and coveralls- Wash hands and face, leave contamination reduction zone- Report for any heat/cold stress surveillance as directed

TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES –SITE 6A & 2, NWIRP, CALVERTON, NY

Revision 0

Task/Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment (Items in <i>italics</i> are deemed optional as conditions or the FOL or SSO dictate)	Decontamination Procedures
		<ul style="list-style-type: none">- As part of site control efforts construct fences or other means of demarcation (i.e. signs and postings) to control and isolate traffic in the work area. Means of demarcation shall also be constructed isolating resource and/or staging areas- All heavy equipment shall be constructed with 3-point mounting system <p>10) Inclement Weather – To minimize hazards of this nature, the following provisions shall be employed</p> <ul style="list-style-type: none">- Wear appropriate clothing for weather conditions- Provide acceptable shelter and replacement liquids for field crews as relief from excessive ambient temperatures- Under conditions of elevated levels of PPE, periods of acclimatization, excessive ambient temperature extremes, or if you believe someone is suffering from a heat/cold related disorder, it may be necessary to conduct heat/cold stress monitoring as prescribed in the monitoring section- Electrical storms/high winds - Suspend or terminate operations until directed otherwise by SSO <p>Follow the provisions as specified in Section 4.0 of the Tetra Tech NUS, Inc Health and Safety Guidance Manual regarding the identification and evaluation of heat/cold stress related conditions</p>			

TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES – SITE 6A & 2, NWIRP, CALVERTON, NY

Revision 0

Operation/Location	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring - Type and Action Levels	Personal Protective Equipment (Items in <i>italics> are deemed optional as conditions on the FOL or SSO dictate)</i>	Decontamination Procedures
Multi-media sampling, including - 2 subsurface soils samples will be collected at Site 6A - 2 subsurface soil samples will be collected at Site 2 - Additional samples (soil, groundwater, free product) may be collected in the future resulting of subsequent work performed as part of this SOW	<p>1) Previous analytical data identified VOCs associated with fuels and solvents as the primary contaminants of concern. Specifically, at Site 6A, xylene, 1,1,1-dichloroethane, chloroethane, 1,1,1-trichloroethane, and tetrachloroethylene were identified as VOCs that could present an exposure hazard if work was performed within excavations. At Site 2, chloroethane was the only VOC that could present an exposure hazard if work was performed within the excavation</p> <p>However, since workers will not be permitted to enter any excavations, it is not anticipated that any of these chemicals are present at sufficient concentrations that are capable of causing an exposure hazard to personnel working in the area of excavations.</p> <p>Further information on these contaminants are presented in Table 6-1</p> <p>2) Transfer of contamination into clean areas</p> <p>Physical hazards:</p> <p>3) Slip, trip, and fall hazards</p> <p>4) Strain/muscle pulls from manual lifting</p> <p>5) Cuts and Lacerations</p> <p>6) Heavy equipment operations</p> <p>7) Ambient temperature extremes (heat/cold stress)</p> <p>8) Site Characterization</p> <p>Natural hazards:</p> <p>9) Inclement weather</p>	<p>Chemical hazards:</p> <p>1) As a general rule, avoiding contact with contaminated media (air, water, soils, etc) will be employed as a universal control measure. Potential exposures and contact with contaminated media is most likely to occur during sampling activities. Samples will be collected directly from the bucket of the backhoe or from stockpiled soils (no personnel will enter excavations, where higher concentrations of potential site contaminants may be present). Administrative controls such as segregating soils, working upwind, covering contaminated soils, etc may be used to control potential exposures. Additionally, PPE and proper decontamination will be used to further reduce the potential for exposure.</p> <p>Significant amounts of dust (airborne particulates) are not anticipated to be generated during site activities. However, if airborne dusts are observed area wetting methods or other controls (avoiding dust plumes, moving operations upwind, etc) will be used to prevent potential exposure to contaminants that may be bound to these particulates.</p> <p>2) Transfer of Contamination into Clean Areas - Decontaminate all equipment and supplies between sampling locations and prior to leaving the site. See decontamination of heavy and sampling equipment for direction in this task.</p> <p>3) Slip, Trip, and Fall Hazards</p> <ul style="list-style-type: none">- Maintain proper housekeeping in all work areas- Preview and inspect work areas to identify and eliminate slip, trip, or fall hazards- Activities to be conducted from more than 6-feet above ground level will require fall protection training and the use of 100% fall protection equipment- Cover, guard, barricade, and or place warning postings over/at open excavations that personnel may fall or step into- For traversing steep, slippery, or sloped terrain establish rope ladders to control ascent and descent to sampling areas or use alternative pathways- Use multiple persons and pack small loads to remote locations <p>4) Strain/Muscle Pulls from Manual Lifting - Use machinery or multiple personnel for heavy lifts. Use proper lifting techniques (See Lifting Mobilization/Demobilization, Page 1 of 6, Table 5-1)</p> <p>5) Cuts and Lacerations – Employ the following measures to reduce and/or eliminate the potential for cuts and lacerations:</p> <ul style="list-style-type: none">- Previewing pathways - Where possible, remove or demarcate the physical hazards- Inspect all cutting equipment to be used to clear access routes for defects.- When cutting items - always use a sharp knife and always cut away from your body. Do not place items to be cut in your opposite hand or on your knee. <p>6) Heavy Equipment Operations</p> <ul style="list-style-type: none">- Stay out of path of moving equipment (distance of the fully extended boom plus 10 feet),- Maintain two-way visual contact with equipment operator and wear high visibility vest- Use a spotter and establish appropriate communications/hand signals w/ operator- Following other guidelines for heavy equipment operations presented in Excavation Section of Table 5-1 and Section 6.2 of this HASP <p>7) Ambient Temperature Extremes (Heat/Cold Stress) - Wear appropriate clothing for weather conditions. Provide acceptable shelter and liquids for field crews. Additional information regarding heat/cold stress is provided in Section 4.0 of the Health and Safety Guidance Manual.</p> <p>8) Site Characterization - Work areas will be surveyed prior to committing personnel or resources. The survey will be conducted by the FOL and/or the SSO. The purpose is to identify physical and natural hazards that may impact the proposed work area. These hazards are to be identified, barricaded, or eliminated to the extent possible to minimize potential effect to field crew.</p> <p>9) Suspend or terminate operations until directed otherwise by the SSO.</p>	<p>Air monitoring will be conducted to evaluate potential airborne concentrations at source areas (excavated dirt, liquids, etc) and at worker breathing zones. Source area monitoring will be used to determine the presence of site contaminants and to assess potential impact to site workers. Observations of elevated readings at a source area will require workers' breathing zones to be monitored to evaluate potential exposures and to determine appropriate course of action to ensure their protection.</p> <p>Air monitoring will be conducted using a PID with a 10.6 eV lamp source and will be required during excavation and sampling activities. During soil screening, odor and elevated PID readings will be used to segregate contaminated soils from clean soils. Once elevated PID readings are observed, worker breathing zones will be evaluated and compared to the following action levels:</p> <ul style="list-style-type: none">• Background readings. Continue working, perform monitoring periodically (concentrating on workers closest to the point of operation/source area of elevated PID reading) or whenever a change in source area readings is noted.• < 10 ppm (sustained readings > 1 minute in duration) Perform continuous monitoring in worker breathing zones. Evaluate if controls can be used to reduce potential exposures (move operations upwind, cover stockpiles, etc)• 10 ppm – suspend site operations and notify the PHSO or HSM for further direction (determining the source, identifying the contaminant, initiating controls, etc) <p>NOTE:</p> <ul style="list-style-type: none">• Although none of the chemicals of concern are anticipated to present an exposure hazard, the Action Levels have been conservatively based on xylene – the chemical constituent most likely to be present and detected by a PID. Other contaminants of concern are not anticipated to be the source of elevated PID readings.• All action levels are based on observed concentrations in worker breathing zones. <p>An LEL/O2 meter will be available at the site to evaluate LEL concentrations of any free product that is encountered during the excavations or site operations. It is not anticipated that monitoring with the LEL/O2 will be required for exposure monitoring purposes. Nor is it anticipated that dangerous LEL concentrations (>10 %) or O2 levels (< 19.5 % or > 23.5%) will be observed during any site operations. If such conditions are found to exist, contact the PHSO or the HSM.</p> <p>Significant dust or airborne particulates are not anticipated to be generated during this activity. So no monitoring activities have been recommended. However, if airborne dusts are observed, appropriate control measures will be implemented (area wetting methods, moving operation upwind, avoiding dust plumes, etc)</p>	<p>Level D protection will be utilized for the following sampling activities:</p> <p>Sampling Personnel</p> <p>Level D - (Minimum Requirements)</p> <ul style="list-style-type: none">- Standard field attire (Sleeved shirt, long pants)- Safety shoes (steel toe/shank)- Safety glasses- Surgical style gloves (<i>double-layered, if necessary</i>)- Orange Safety Vests when working in vicinity of heavy equipment- <i>Tyvek coveralls and disposable boot covers, if the potential for soiling work attire exists</i> <p>Note: The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p>Personnel Decontamination</p> <p>Sampling surface water, groundwater, and sediments, the following provisions will apply:</p> <ul style="list-style-type: none">- Upon completion of the sampling dedicated trowels, tubing, etc. will be bagged for transport back to the central decontamination area.- PPE (gloves) will be removed and also bagged for disposal.- Handi-Wipes or similar product will be used to clean hands, prior to moving to the next location. <p>Equipment Decontamination</p> <p>All equipment used in remote sampling locations will be brought back to the central decontamination area for decontamination and re-use or disposal.</p> <p>Decontamination of equipment (sampling and hand tools) will proceed as indicated in the Work Plan.</p>

TABLE 5-1
TASKS/HAZARDS/CONTROL MEASURES – SITE 6A & 2, NWIRP, CALVERTON, NY

Tasks/Operation/Locations	Anticipated Hazards	Recommended Control Measures	Hazard Monitoring – Type and Action Levels	Personal Protective Equipment (Items in <i>italics</i> are deemed optional as conditions or the FOL or SSO dictate.)	Decontamination Procedures
<p>Decontamination of Sampling and Heavy Equipment (Backhoe)</p> <p>It is anticipated that this activity will take place at centralized locations. Gross contamination will be removed to the extent possible at the site.</p>	<p>Chemical hazards:</p> <p>1) Previous analytical data identified VOCs associated with fuels and solvents as the primary contaminants of concern. Specifically, at Site 6A, xylene, 1,1-dichloroethane, chloroethane, 1,1,1-trichloroethane, and tetrachloroethylene were identified as VOCs that could present an exposure hazard if work was performed within excavations. At Site 2, chloroethane was the only VOC that could present an exposure hazard if work was performed within the excavation.</p> <p>However, since workers will not be permitted to enter any excavations, it is not anticipated that any of these chemicals are present at sufficient concentrations that are capable of causing an exposure hazard to personnel working in the area of excavations.</p> <p>Additional information on contaminants positively identified are provided in Table 6-1.</p> <p>2) Decontamination fluids - Liquinox (detergent), isopropanol (decontamination solvent)</p> <p>Physical hazards:</p> <p>3) Lifting (strain/muscle pulls) 4) Noise in excess of 85 dBA 5) Flying projectiles 6) Slips, trips, and falls</p> <p>Natural hazards:</p> <p>7) Inclement weather</p>	<p>1) and 2) Employ protective equipment to minimize contact with site contaminants and hazardous decontamination fluids. Control potential non-occupational exposures through good work hygiene practices (i.e., avoid hand to mouth contact; wash hands and face before breaks and lunch, minimize contact with contaminated media). Obtain manufacturer's MSDS for any decontamination fluids used on-site. Solvents may only be used in well-ventilated areas, such as outdoors. Use appropriate PPE as identified on MSDS or within this HASP. All chemicals used must be listed on the Chemical Inventory for the site, and site activities must be consistent with the Hazard Communication Program provided in Section 5.0 of the TINUS Health and Safety Guidance Manual.</p> <p>3) Use multiple persons where necessary for lifting and handling heavy equipment for decontamination purposes.</p> <ul style="list-style-type: none">- Employ proper lifting techniques as described in Table 5-1, Mobilization/Demobilization <p>4) Wear hearing protection when operating the pressure washer and/or steam cleaner. Sound pressure levels measured during the operation of similar pieces of equipment indicate a range of 87 to 93 dBA.</p> <p>5) Use eye and face protective equipment when operating the pressure washer and/or steam cleaner, due to flying projectiles. All other personnel must be restricted from the area. In addition to minimize hazards (flying projectiles, water lacerations and burns) associated with this operation, the following controls will be implemented:</p> <ul style="list-style-type: none">- A Fan Tip 25° or greater will be used on pressurized systems over 3,000 psi. This will reduce the possibility of water lacerations or punctures.- Thermostat control will be in place and operational to control the temperature levels of the water where applicable.- Visual evaluations of hoses and fittings for structural defects.- Construct deflection screens as necessary to control overspray and to guard against dispersion of contaminants driven off by the spray. <p>6) The decontamination pad should be constructed to contain wash waters generated during decontamination procedures. Temporary decontamination pads are usually 10-30 mil polyethylene or polyvinyl chloride tarp construction. Although these items when used as a liner offer containment, they also present a slipping hazard. When these temporary liners are employed, it is recommended that a light coating of sand be spread over the walking surface to provide traction.</p> <ul style="list-style-type: none">- In addition, adequate slope should be provided to the pad to permit drainage away from the object being cleaned. The collection point for wash waters should be of adequate distance that the decontamination workers do not have to walk through the wash waters while completing their tasks.- Hoses should be gathered when not in use to eliminate potential tripping hazards. <p>7) Suspend or terminate operations until directed otherwise by SSO.</p>	<p>Use visual observation and real-time monitoring instrumentation to ensure all equipment has been properly cleaned of contamination and dried.</p> <p>Monitoring instrumentation will be employed to determine if all of the decontamination solvent (isopropanol) has been removed through the rinse process. Any positive indication/results greater than background require the article that has been decontaminated to be re-rinsed and scanned again. If necessary, this process should be repeated until no measurable indication of the decontamination solvent exists.</p>	<p>For Heavy Equipment</p> <p>This applies to pressure washing and/or steam cleaning operations and soap/water wash and rinse procedures.</p> <p>Level D Minimum requirements:</p> <ul style="list-style-type: none">- Standard field attire (Long sleeve shirt, long pants)- Safety shoes (Steel toe/shank)- Chemical resistant boot covers- Nitrile outer gloves over nitrile inner gloves- Safety glasses underneath a splash shield- Hearing protection (plugs or muffs)- Hooded PVC Rainsuits or PE or PVC coated Tyvek <p>Impermeable aprons may be used instead of coveralls if they offer adequate protection against overspray and back splash.</p> <p>For sampling equipment (trowels, bailers, etc.), the following PPE is required:</p> <p>Note: Consult MSDS for PPE guidance. Otherwise, observe the following:</p> <p>Level D Minimum requirements:</p> <ul style="list-style-type: none">- Standard field attire (Long sleeve shirt, long pants)- Safety shoes (Steel toe/shank)- Nitrile outer gloves over nitrile inner gloves- Safety glasses- Impermeable apron <p>In the event of overspray of chemical decontamination fluids, employ PVC Rainsuits or PE or PVC coated Tyvek as necessary.</p> <p>Note: The Safe Work Permit(s) for this task (See Attachment IV) will be issued at the beginning of each day to address the tasks planned for that day. As part of this task, additional PPE may be assigned to reflect site-specific conditions or special considerations or conditions associated with any identified task.</p>	<p>Personnel Decontamination will consist of a soap/water wash and rinse for reusable and non-reusable outer protective equipment (boots, gloves, PVC splash suits, as applicable). This decontamination function may be subdivided into two locations.</p> <p>Gross contamination of outer boots and outer gloves will be removed at a satellite location near the operation.</p> <p>Final wash and rinse will take place at the centralized decontamination pad.</p> <p>The sequential procedure is as follows:</p> <p>Stage 1: Equipment drop, remove outer protective wrapping, personnel will wipe down the outer shell and pass hand equipment through as necessary.</p> <p>Stage 2: Soap/water wash and rinse of outer boots and gloves.</p> <p>Stage 3: Soap/water wash and rinse of the outer splash suit, as applicable.</p> <p>Stage 4: Disposable PPE will be removed and bagged.</p> <p>Stage 5: Wash face and hands.</p> <p>Equipment Decontamination - All heavy equipment decontamination will take place at a centralized decontamination pad utilizing a steam cleaner or pressure washer. Heavy equipment will have the wheels and tires cleaned along with any loose debris removed, prior to transporting to the central decontamination area. All site vehicles will have restricted access to exclusion zones, and have their wheels/tires cleaned/sprayed off as not to track mud onto the roadways servicing this installation. Roadways shall be cleared of any debris resulting from the on-site activity.</p> <p>Sampling Equipment Decontamination</p> <p>Sampling equipment will be decontaminated as per the requirements indicated within the Work Plan Addendum.</p> <p>All equipment used in the exclusion zone will require a complete decontamination between locations and prior to removal from the site.</p> <p>The FOL or the SSO will be responsible for evaluating equipment arriving on-site, leaving the site, and between locations. No equipment will be authorized access, exit, or movement to another location without this evaluation.</p>

6.0 HAZARD ASSESSMENT

The following section provides information regarding the chemical, physical, and natural hazards anticipated to be present during the activities to be conducted. Table 6-1 provides information related to chemical constituents that have been identified by analysis or are suspected to be present at the site based on historical data. Specifically, toxicological information, exposure limits, symptoms of exposure, physical properties, and air monitoring and sampling data is discussed in the table.

6.1 CHEMICAL HAZARDS

The potential health hazards associated with the tasks to be conducted at NWIRP Calverton include inhalation, ingestion, and dermal contact with contaminants that may be present in subsurface soils and groundwater. Based on prior sampling activities at the site and site history, the primary types of contaminants include petroleum-based liquids (fuels) and solvents. Remediation activities at Site 6A have greatly reduced the extent of contamination and in most cases the Volatile Organic Compounds (VOCs) associated with fuels and solvents are at concentrations that are too low to present a significant exposure concern to site personnel. The following have been identified as the primary potential contaminants from a health and safety perspective:

- VOCs including fuels and solvents.
 - **Site 6A** – xylene, 1,1-dichloroethane, chloroethane, 1,1,1-trichloroethane, and tetrachloroethylene. These chemicals pose a more significant hazard in confined spaces (such as an open excavation) that allow concentrations to accumulate rather than be dispersed.
 - **Site 2** – Chloroethane may pose a hazard to personnel if work is performed in an excavation.

NOTE: It should be noted that the above chemicals of concern are most likely to present a hazard within open excavations. The possible presence of any free product or liquids within excavations may facilitate the evolution of airborne vapors and compromise the stability of the excavation. Chemicals of concern are not anticipated to be present at concentrations that pose an exposure hazard to personnel that are working at the surface. It should be noted that personnel will **not** be permitted to enter open excavations as part of the scope of work.

Table 6-1 provides information on the individual substances likely to be present at the sites of concern. Included is information on the toxicological, chemical, and physical properties of these substances. It is

anticipated that the greatest potential for exposure to site contaminants is during intrusive activities (excavation operations) where large quantities of potential contaminated soil are disturbed. Exposure to these compounds is most likely to occur through inhalation of VOCs released from contaminated soil or water, or through skin contact with contaminated media and free product. For this reason, safe work practices (prevent access into excavations, remote sample collection via backhoe bucket, etc.) and the use off PPE and basic hygiene practices (washing face and hands before leaving site) will be important in preventing potential exposures.

6.2 PHYSICAL HAZARDS

The physical hazards that may be present during the performance of site activities are summarized below:

- Heavy equipment hazards (moving components, rotating equipment, etc.).
- Slips, trips, and falls
- Energized systems (contact with underground or overhead utilities)
- Lifting (strain/muscle pulls)
- Noise in excess of 85 decibels (dBA)
- Open excavations
- Pinches and compressions
- Vehicular and foot traffic
- Heat stress

These physical hazards are discussed in Table 5-1 as applicable to each site task. Further, many of these hazards are discussed in detail in Section 4.0 of the Health and Safety Guidance Manual. Specific discussions on some of these hazards are presented below.

6.2.1 Heavy Equipment Hazards (Moving components, rotating equipment, etc.)

Often the hazards associated with equipment operations are the most dangerous to be encountered during site activities. The SSO will thoroughly discuss safe excavation procedures during the site-specific training session. All site personnel will sign the form in Figure 8-2 documenting that they received the training and understand the procedures. The following rules will apply to all excavation operations:

- Personnel not directly involved in the excavation will remain a safe distance away from operating equipment and moving machinery and will employ the following safe work practices:

- Maintain a safe distance (the distance of the fully extended boom plus 10 feet) away from operating equipment.
- Maintain constant visual contact with equipment operators.
- No personnel will be permitted to enter excavations while equipment is operating.
- Use high visibility vests or clothing.
- Restrict access to areas near operating equipment and if necessary redirect vehicle and pedestrian traffic away from the work area.
- Permit only properly licensed and trained equipment operators.
- Ensure equipment is in proper working order and that regular maintenance intervals are maintained.

6.2.2 Energized Systems (Contact with Underground or Overhead Utilities)

Underground utilities such as pressurized lines, water lines, telephone lines, buried utility lines, and high voltage power lines may be present throughout the facility. **Therefore, all subsurface activities must be conducted following the requirements of the TtNUS SOP for "Utility Locating and Excavation Clearance (HS-1.0)".** A copy of this SOP is provided as Attachment V. Clearance of underground and overhead utilities for each sample location will be coordinated with NWIRP Calverton personnel. Additionally, excavation operations will be conducted at a safe distance (>20 feet) from overhead power lines.

6.2.3 Open Excavations

All excavation operations will be performed in accordance with Subpart P of OSHA 29 CFR 1910.26.650 to .652 standard. The location of each excavation will be prepared which includes conducting underground and overhead utility locating surveys, removing obstacles (e.g., AS/VE piping), and installing fencing or other appropriate barricades to prevent access. No site personnel will be permitted to enter any excavation given increased hazard (potential for cave-ins and falling debris, potential for higher concentrations of site contaminants due to accumulation, confined space concerns, oxygen deficiency, etc.).

6.3 NATURAL HAZARDS

Insect/animal bites and stings, poisonous plants, and inclement weather are natural hazards that may be present given the location of activities to be conducted. In general, avoidance of areas of known infestation or growth will be the preferred exposure control for insects/animals and poisonous plants. Specific discussion on principle hazards of concern follows:

6.3.1 Insect/Animal Bites and Stings, Poisonous Plants, etc.

During warm months (spring through early fall), tick-borne Lyme Disease may pose a potential health hazard. The longer a disease carrying tick remains attached to the body, the greater the potential for contracting the disease. Wearing long sleeved shirts and long pants (tucked into boots). As well as performing frequent body checks will prevent long term attachment. Site first aid kits should be equipped with medical forceps and rubbing alcohol to assist in tick removal. For information regarding tick removal procedures, and symptoms of exposure, consult Section 4.0 of the Health and Safety Guidance Manual.

Contact with poisonous plants and bites or stings from poisonous insects are other biological hazards that must be considered. Long pants (tucked into boots), and avoiding potential nesting areas will minimize the hazards of exposure. All site personnel who are allergic to stinging insects such as bees, wasps, and hornets must be particularly careful since severe illness and death may result from allergic reactions. As with any medical condition or allergy, information regarding the condition must be listed on the Medical Data Sheet and the FOL and SSO notified.

6.3.1.1 West Nile Virus

In the Fall of 1999 Federal health officials confirmed the presence of the West Nile Virus in horses from eastern Suffolk County. In 2000, 21 cases were reported in the New York and New Jersey areas including 2 deaths. There have not be any confirmed human cases in Suffolk County and there were no reported cases of the West Nile encephalitis in humans. Spraying activities were started but suspended when the weather turned cold and mosquito activity greatly diminished. At the time even though the mosquito population was at a minimum, residents were still urged to take personal precautions. It is unknown at this time if it is expected to resume this Spring.

Encephalitis is an inflammation of the brain and can be caused by bacteria and viruses. West Nile encephalitis is caused by a virus transmitted to humans by mosquitoes. West Nile virus is commonly found in Africa, West Asia, and the Middle East. It is closely related to St. Louis encephalitis virus found in the United States. The West Nile-like virus that has been found in New York is genetically related to West Nile virus, but because of genetic differences it may be a new subtype of West Nile virus.

The mosquito becomes infected by feeding on birds infected with the West Nile virus. Infected mosquitoes then transmit the West Nile virus to humans and animals when biting (or taking a blood-meal). West Nile encephalitis is NOT transmitted from person-to-person. There is no evidence that a person can get the virus from handling live or dead infected birds. However, avoid bare-handed contact when handling any dead animals, including dead birds. Ticks have not been implicated as vectors of West Nile-like virus.

Mild infections are common and include fever, headache, and body aches, often with skin rash and swollen lymph glands. More severe infection is marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions, paralysis and, rarely death (especially in the elderly and very young). The incubation period of West Nile encephalitis is usually 3 to 12 days. There is no specific therapy or vaccine against West Nile encephalitis. No cases have previously been reported in the U.S. prior to September 1999 (in New York). It is not known how long it has been in the U.S., but scientists believe the virus has probably been in the eastern U.S. for several months, possibly longer.

Precautions from the Suffolk County Department of Health include:

- Limit outdoor activities during peak mosquito times – at dusk and dawn.
- Avoid standing water
- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Apply insect repellent to exposed skin following manufactures instructions. An effective repellent will contain 20% to 30% DEET (N,N-diethyl-meta-toluamide). Avoid products containing more than 30% DEET.
- Spray clothing with repellents containing permethrin or DEET, mosquitoes may bite through thin clothing.

For further information contact:

Suffolk County Department of Health Services
225 Rabro Drive
Hauppauge, NY 11788
(631) 853-3002.

6.3.2 Inclement Weather

Many of the project tasks under this Scope of Work will be performed outdoors. As a result, inclement weather may be encountered. In the event that adverse weather (electrical storms, hurricanes, etc.) conditions arise, the FOL and/or the SSO will be responsible for temporarily suspending or terminating activities until hazardous conditions no longer exist.

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
SITE 6A & 2 – NWIRP, CALVERTON, NEW YORK

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
FUELS AS REPRESENTED BY THE FOLLOWING:							
Diesel Fuel No 2-D	Mixture	Components of this substance will be detected readily however no documentation exists as to the relative response ratio of either PID or FID	Air sampling use charcoal tube as a collection media, carbon disulfide desorption, GC/FID detection Sampling and analytical protocol in accordance with NIOSH Method #1550	OSHA/NIOSH/ACGIH 5 mg/m³ as mineral oil mist In addition NIOSH and ACGIH establish 10 mg/m³ as a STEL	Kerosene odor Recommended Air Purifying cartridges: Organic vapor Recommended gloves: Nitrile	Boiling Pt: <170-400°F, 77-204°C Melting Pt: Not available Solubility: Negligible Flash Pt: 125°F, 52°C LEL/LFL: 0.6% UEL/UFL: 7.5% Vapor Density: >5 Vapor Pressure: <1 mmHg @ 70°F, 21°C Specific Gravity: 0.86 Incompatibilities: strong oxidizers, halogens, and hypochlorites Appearance and odor: Colorless to amber with a kerosene odor	Prolonged or repeated exposures to this product may cause skin and eye irritation Due to the defatting capabilities this exposure may lead to a dermatitis condition High vapor concentrations are irritating to the eyes and respiratory tract Exposure to high airborne concentrations may result in narcotic effects including dizziness, headaches, and anesthetic to unconsciousness High concentrations in a confined space may adequately displace oxygen thereby resulting in suffocation
Gasoline	8006-61-9	Relative response ratios for the components of gasoline range from 100 - 200% for PID and FID detection	See components for measurement considerations	ACGIH & OSHA 300 ppm 500 ppm STEL NIOSH Reduce to lowest feasible concentration	Respiratory Protection: Odor threshold 0.7 ppm, adequate air purifying respirator with organic vapor cartridges up to 100 ppm Recommended Gloves Nitrile >6.00 hrs, PV alcohol >6.00 hrs, Viton/neoprene >8.00 hrs	Boiling Pt: 102°F, 39°C Melting Pt: Not available Solubility: Negligible Flash Pt: -50°F, -45°C LEL/LFL: 1.4% UEL/UFL: 7.6% Vapor Density: ~5 Vapor Pressure: 38-300 mmHg (varies seasonally) Specific Gravity: 0.74 @ 20/20°C Incompatibilities: Strong oxidizers, peroxides, strong acids, and perchlorates Appearance and Odor: Colorless liquid with gasoline odor	Overexposure to this substance may result in irritation to the eyes, skin, and mucous membranes Systemically, headache, fatigue, blurred vision, dizziness, slurred speech, confusion, possible convulsion, and chemical pneumonia (aspiration) Prolonged or chronic exposures may result in possible liver or kidney damage Components of this substance have been determined to be confirmed human carcinogens

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
SITE 6A & 2 – NWIRP, CALVERTON, NEW YORK

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
JP-4	N/A	Components of this substance will be detected readily however no documentation exists as to the relative response ratio of either the PID or FID	Air sample using charcoal tube and carbon disulfide desorption, Sampling and analytical protocol shall proceed in accordance with NIOSH Method #1501	USAF 8 hr - 200 ppm	Kerosene odor threshold ~ 800 ppm Rating - Poor to Adequate Recommended Air Purifying cartridges: Organic vapor Recommended gloves: Nitrile	Boiling Pt: <290-470°F, 143-243°C Melting Pt: Not available Solubility: Negligible Flash Pt: -10 to -50°F, -23 to -45°C LEL/LFL: <1% UEL/UFL: 8% Vapor Density: >1 Vapor Pressure: 75 mmHg, 70°F, 21°C Specific Gravity: 0.78 Incompatibilities: strong oxidizers Appearance and odor: Colorless to amber with a kerosene odor	Based on the constituents of jet fuels, it can be surmised that JP-4 is irritating to the eyes, skin, and respiratory tract Direct contact may result in mild irritation with a possible drying and defatting of the skin Ingestion may result in gastrointestinal irritation, nausea, and vomiting and may be harmful or even fatal Inhalation of vapors or mists of JP-4 may result in headache, nausea, confusion, narcotic effect, and drowsiness Chronic inhalation of jet fuel vapors may produce symptoms such as fatigue, anxiety, mood changes, liver, and kidney damage, and memory difficulties in exposed workers
JP-8 (typically constituted of 95% or more Kerosene, with small percentages of naphthalene and 2-methoxy ethanol)	8008-20-6 (kerosene)	Not known for kerosene However, naphthalene and 2-methoxy ethanol are readily detected by a PID)	NIOSH Method 1550 for naphthalene is recommended for sampling for kerosene. This method involves using a 2-section sorbent tube packed with coconut shell charcoal sorbent medium, which is analyzed via GC-FID	None specified for JP-8 or kerosene Naphthalene OSHA PEL=10 ppm as a TWA NIOSH REL=10 ppm as a TWA, STEL=15 ppm	None specified for kerosene. Naphthalene: Odor threshold 0.64-1.02 ppm Naphthalene odor characteristics: tar/creosote/mothballs 2-methoxyethanol: Odor thresholds and characteristics not reported by AIHA	Characteristics vary by fuel blending and grade (e.g., impurities and additives) Flash Pt: 100°F, 38°C Boiling Pt: 320°F, 160°C Melting Pt: -58°F, -50°C Vapor Density: >1 - 5 Vapor Pressure: <5 @ 20°C SG: 0.81 Solubility in water: Negligible (>0.1%) Appearance and Odor: Clear white liquid with kerosene odor Avoid contact with heat, sparks and flame Avoid contact with strong oxidizing agents	Overexposure to this substance may result in irritation to the eyes, skin, and respiratory tract. May cause, headache, dizziness, and other CNS effect

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
SITE 6A & 2 – NWIRP, CALVERTON, NEW YORK

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
CONSTITUENT CHEMICALS OF CONCERN							
Xylene All isomers o-,m-, p-	1330-20-7	PID 1 P 8 56 eV, High response with PID and 10 2 eV lamp FID 110% response with FID	Air sample using charcoal tube, carbon disulfide desorption, GC/FID detection Sampling and analytical protocol shall proceed in accordance with OSHA 07, or NIOSH Method 1500	ACGIH, & NIOSH 100 ppm, 150 ppm STEL OSHA 100 ppm IDLH 900 ppm	Adequate - Odor thresholds for the following isomers 0.6 m-, 5.4 p-, 20 o- ppm Can use air-purifying respirator with organic vapor cartridge up to 1,000 ppm concentrations Recommended gloves: PV Alcohol >12.67 hrs, Viton >8.00 hrs, CPE >1.00 hr, Butyl 0.87 hrs, Nitrile is acceptable for limited operations and contact (>0.20 hrs)	Boiling Pt: 269-281°F, 132-138°C Melting Pt: -130/-54m/56p°F, -25o/-48m/13p °C Solubility: 0.02 % Flash Pt: 81-90°F, 27-32°C LEL/LFL: 0.9% UEL/UFL: 7.0% Vapor Density: 3.66 Vapor Pressure: 7-9 mmHg @ 70°F, 21 °C Specific Gravity: 0.86-0.88 Incompatibilities: Strong oxidizers and strong acids Appearance and odor: Colorless liquid with an aromatic odor	Effects may of overexposure include irritation at all points of contact, CNS changes (i.e. dizziness, excitement, drowsiness, incoherent, staggering gait), difficulty in breathing, pulmonary edema, and possibly respiratory failure Chronic effects may include dermatitis and cornea vacuolization
1,1-Dichloroethane	75-34-3	PID 1 P 11 06 eV, relative response ratio unknown FID 80% relative response ratio with FID	Air sample using charcoal tube, carbon disulfide desorption Sampling and analytical protocol shall proceed in accordance with OSHA Method #07-B or NIOSH Method #1003	OSHA, NIOSH, ACGIH 100 ppm IDLH 4000 ppm	Questionable warning properties - Odor threshold 49 - 1359 ppm APRs may be employed for escape only Exceedances over the exposure limits are recommended to use airline or airline/APR combination type respirator Recommended glove: Butyl, Polyvinyl alcohol, Viton	Boiling Pt: 135°F, 57°C Melting Pt: -143°F, -97°C Solubility: 0.6% Flash Pt: 2°F, -17°C LEL/LFL: 5.6% UEL/UFL: 11.4% Vapor Density: 3.42 Vapor Pressure: 182 mmHg Specific Gravity: 1.18 Incompatibilities: Strong oxidizers, strong caustics Appearance and odor: Colorless, oily liquid with a chloroform-like odor	Overexposure may result in CNS depression, skin and eye irritation, and damage to the liver, kidneys, and lungs

TABLE 6-1
CHEMICAL, PHYSICAL, AND TOXICOLOGICAL DATA
SITE 6A & 2 – NWIRP, CALVERTON, NEW YORK

Substance	CAS No.	Air Monitoring/Sampling Information		Exposure Limits	Warning Property Rating	Physical Properties	Health Hazard Information
Tetrachloroethylene See also Perchloroethylene PERK PCE	127-18-4	PID 1 P 9 32 eV, relative response ratio 200% with 10 6 eV lamp FID 70% relative response ratio with a FID	Air sample using charcoal tube, carbon disulfide desorption, GC/FID detection Sampling and analytical protocol shall proceed in accordance with OSHA Method #07, or NIOSH Method #1003	ACGIH 25 ppm 100 ppm STEL OSHA 100 ppm 200 ppm Ceiling, 300 ppm 5- minute max peak in any 3-hr period IDLH 150 ppm	Odor threshold for this substance has been determined to be at airborne concentrations of approximately 47 ppm, which is considered adequate APR with organic vapor/acid gas cartridges should be used for escape purposes only Exceedances over the recommended exposure limits requires the use of airline or airline/APR combination units Recommended glove: Viton, PV alcohol 5-16 hrs, silver shield >6 00 hrs, teflon 10-24 hrs, and Nitrile in that order The breakthrough time for the nitrile glove ranges between 1 5 - 5 5 hrs during complete immersion	Boiling Pt: 250°F, 121°C Melting Pt: -2°F, 19°C Solubility: 0 02% Flash Pt: Not available LEL/LFL: Not available UEL/UFL: Not available Vapor Density: 5 83 Vapor Pressure: 14 mmHg @ 77°F, 25°C Specific Gravity: 1 62 @ 77°F, 25°C Incompatibilities: Strong oxidizers, alkalis, fuming sulfuric acid, and chemically active metals When heated to decomposition temperatures will emit toxic fumes of chlorine Appearance and Odor: Colorless liquid with a mild chloroform like odor	Overexposure may result in irritation to eyes, nose, throat, and skin Potential CNS effects including sleepiness, incoordination, headaches, hallucinations, distorted perceptions, and stupor (narcosis) Systemically, symptoms may result in nausea, vomiting, weakness, tremors, and cramps Chronic exposures may result in dermatitis, enlarged tender liver, kidney, and lung damage This material is considered a animal carcinogen (liver tumors), however, inadequate evidence exists concerning carcinogenic potential in humans

7.0 AIR MONITORING

Direct reading instruments (DRIs) such as a Photoionization Detector (PID) will be used to screen source areas (excavated soil) and worker breathing zones to detect the presence of VOCs associated with site contaminants. Action levels are listed in Table 5-1 as they may apply to a specific task or location. This approach (coupled with the use of personal protective equipment and the observance of the other control requirements presented in this HASP) will minimize the potential for personnel exposures to hazardous concentrations of airborne contaminants. Additionally, the Health and Safety Guidance Manual, Section 1.0, contains detailed information regarding direct reading instrumentation, as well as general calibration procedures of various instruments.

7.1 INSTRUMENTS AND USE

Instruments will be used primarily to monitor excavated soils and worker breathing zone areas, while observing instrument action levels. Action levels are discussed in Table 5-1 as they may apply to a specific task or location.

7.1.1 Photoionization Detector or Flame Ionization Detector

In order to accurately monitor for any substances which may present an exposure potential to site personnel, a Photoionization Detector (PID) using a lamp energy of 10.6 eV or higher will be used. This instrument will be used to monitor potential source areas and to screen the breathing zones of employees during site activities. The PID has been selected because it is capable of detecting some of the organic vapors of concern (NOTE: A Flame Ionization Detector [FID] may be used as an alternative to the PID).

Prior to the commencement of any field activities, the background levels of the site must be determined. Daily background readings will be taken in clean areas away from any potential contamination. These readings, any influencing conditions (i.e., weather, temperature, humidity) and site location must be documented in the field operations logbook or other site documentation (e.g., sample log sheet).

7.1.2 Hazard Monitoring Frequency

Table 5-1 presents the frequencies that hazard monitoring will be performed as well as the action levels which will initiate the use of elevated levels of protection. The SSO may decide to increase these frequencies based on instrument responses and site observations. The frequency at which monitoring is performed will not be reduced without the prior consent of the PHSO or HSM.

7.2 INSTRUMENT MAINTENANCE AND CALIBRATION

Hazard monitoring instruments will be maintained and pre-field calibrated by the TtNUS Equipment Manager. Operational checks and field calibration will be performed on all instruments each day prior to their use. Field calibration will be performed on instruments according to manufacturer's recommendations (for example, the PID must be field calibrated daily and an additional field calibration must be performed at the end of each day to determine any significant instrument drift). These operational checks and calibration efforts will be performed in a manner that complies with the employees health and safety training, the manufacturer's recommendations, and with the applicable manufacturer standard operating procedure (copies of which can be found in the Health & Safety Guidance Manual which will be maintained on site for reference). All calibration efforts must be documented. Figure 7-1 is provided for documenting these calibration efforts. This information may instead be recorded in a field operations logbook, provided that all of the information specified in Figure 7-1 is recorded. This required information includes the following:

- Date calibration was performed
- Individual calibrating the instrument
- Instrument name, model, and serial number
- Any relevant instrument settings and resultant readings (before and after) calibration
- Identification of the calibration standard (lot no., source concentration, supplier)
- Any relevant comments or remarks

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NO.: _____

[illegible]

8.0 TRAINING/MEDICAL SURVEILLANCE REQUIREMENTS

8.1 INTRODUCTORY/REFRESHER/SUPERVISORY TRAINING

This section is included to specify health and safety training and medical surveillance requirements for both TtNUS and subcontractor personnel participating in site activities.

8.1.1 Requirements for TtNUS Personnel

All TtNUS personnel must complete 40 hours of introductory hazardous waste site training prior to performing work at the NWIRP facility. Additionally, TtNUS personnel who have had introductory training more than 12 months prior to site work must have completed 8 hours of refresher training in the past 12 months before being cleared for site work. In addition, 8-hour supervisory training in accordance with 29 CFR 1910.120 (e)(4) will be required for site supervisory personnel.

Documentation of TtNUS introductory, supervisory, and refresher training as well as site-specific training will be maintained at the project. Copies of certificates or other official documentation will be used to fulfill this requirement.

8.1.2 Requirements for Subcontractors

All TtNUS subcontractor personnel must have completed introductory hazardous waste site training or equivalent work experience as defined in OSHA Standard 29 CFR 1910.120 (e). Additionally, personnel who have had the introductory training more than 12 months ago, are required to have 8 hours of refresher training meeting the requirements of 29 CFR 1910.120 (e)(8) prior to performing field work at the NWIRP facility if required. TtNUS subcontractors must certify that each employee has had such training by sending TtNUS a letter, on company letterhead, containing the information in the example letter provided as in Figure 8-1 and by providing copies of certificates for all subcontractor personnel participating in site activities.

**FIGURE 8-1
TRAINING LETTER**

The following statements must be typed on company letterhead and signed by an officer of the company and accompanied by copies of personnel training certificates:

LOGO
XYZ CORPORATION
555 E. 5th Street
Nowheresville, Kansas 55555

Month, day, year

Mr. David D. Brayack
Project Manager
Tetra Tech NUS, Inc.
661 Andersen Drive
Pittsburgh, Pennsylvania 15220

Subject: HAZWOPER Training for NWIRP, Calverton, New York

Dear Mr. Brayack:

As an officer of XYZ Corporation, I hereby state that I am aware of the potential hazardous nature of the subject project. I also understand that it is our responsibility to comply with all applicable occupational safety and health regulations, including those stipulated in Title 29 of the Code of Federal Regulations (CFR), Parts 1900 through 1910 and Part 1926.

I also understand that Title 29 CFR 1910.120, entitled "Hazardous Waste Operations and Emergency Response," requires appropriate level of training for certain employees engaged in hazardous waste operations. In this regard, I hereby state that the following employees have had 40 hours of introductory hazardous waste site training or equivalent work experience as requested by 29 CFR 1910.120(e) and have had 8 hour of refresher training as applicable and as required by 29 CFR 1910.120(e)(8) and that site supervisory personnel have had training in accordance with 29 CFR 1910.120(e)(4).

LIST FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555

Sincerely,

(Name and Title of Company Officer)

Enclosed: Training Certificates

8.2 SITE-SPECIFIC TRAINING

TtNUS will provide site-specific training to all TtNUS employees and subcontractor personnel who will perform work on this project. Site-specific training will also be provided to all personnel (U.S. Department of Defense, EPA, etc.) who may enter the site to perform functions that may or may not be directly related to site operations. Site-Specific training will include:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Contents of the Health and Safety Plan
- Emergency response procedures (evacuation and assembly points)
- Incipient response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Review of the use of Safe Work Permits

Site-specific documentation will be established through the use of Figure 8-2. All site personnel and visitors must sign this document upon receiving site-specific training.

8.3 MEDICAL SURVEILLANCE

8.3.1 Medical Surveillance Requirements for TtNUS Personnel

All TtNUS personnel participating in project field activities will have had a physical examination meeting the requirements of TtNUS's medical surveillance program and will be medically qualified to perform hazardous waste site work using respiratory protection.

Documentation for medical clearances will be maintained in the TtNUS Pittsburgh office and made available, as necessary.



8.3.2 Medical Surveillance Requirements for Subcontractors

Subcontractors are required to obtain a certificate of their ability to perform hazardous waste site work and to wear respiratory protection. The "Subcontractor Medical Approval Form" provided in Figure 8-3 shall be used to satisfy this requirement, providing it is properly completed and signed by a licensed physician.

Subcontractors who have a company medical surveillance program meeting the requirements of paragraph (f) of OSHA 29 CFR 1910.120 can substitute "Subcontractor Medical Approval Form" (See Figure 8-3) with a letter, on company letterhead, containing all of the information in the example letter presented in Figure 8-4 of this HASP.

8.3.3 Requirements for All Field Personnel

Each field team member (including subcontractors) and visitors entering the Exclusion Zone(s) shall be required to complete and submit a copy of Medical Data Sheet found in the TtNUS Health and Safety Guidance Manual. This shall be provided to the SSO, prior to participating in site activities. The purpose of this document is to provide site personnel and emergency responders with additional information that may be necessary in order to administer medical attention.

8.4 SUBCONTRACTOR EXCEPTIONS

Subcontractors who will not enter the Exclusion Zone during intrusive operations, and whose activities involve no potential for exposure to site contaminants, will not be required to meet the requirements for training/medical surveillance other than those stated for site-specific training (See Section 8.2).

FIGURE 8-3

SUBCONTRACTOR MEDICAL APPROVAL FORM

For employees of _____
Company Name

Participant Name: _____ Date of Exam: _____

Part A

The above-named individual has:

1. Undergone a physical examination in accordance with OSHA Standard 29 CFR 1910.120, paragraph (f) and found to be medically -

- ☐ () qualified to perform work at the NWIRP Calverton work site
- ☐ () not qualified to perform work at the NWIRP Calverton work site

and,

2. Undergone a physical examination as per OSHA 29 CFR 1910.134(b)(10) and found to be medically -

- ☐ () qualified to wear respiratory protection
- ☐ () not qualified to wear respiratory protection

My evaluation has been based on the following information, as provided to me by the employer.

- ☐ () A copy of OSHA Standard 29 CFR 1910.120 and appendices.
- ☐ () A description of the employee's duties as they relate to the employee's exposures.
- ☐ () A list of known/suspected contaminants and their concentrations (if known).
- ☐ () A description of any personal protective equipment used or to be used.
- ☐ () Information from previous medical examinations of the employee which is not readily available to the examining physician.

Part B

I, _____, have examined _____
Physician's Name (print) Participant's Name (print)
and have determined the following information:

FIGURE 8-3
SUBCONTRACTOR MEDICAL APPROVAL FORM
PAGE TWO

1. Results of the medical examination and tests (excluding finding or diagnoses unrelated to occupational exposure):

2. Any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health:

3. Recommended limitations upon the employee's assigned work:

I have informed this participant of the results of this medical examination and any medical conditions which require further examination or treatment.

Based on the information provided to me, and in view of the activities and hazard potentials involved at the NWIRP Calverton work site, this participant

- () may
() may not

perform his/her assigned task.

Physician's Signature _____

Address _____

Phone Number _____

NOTE: Copies of test results are maintained and available at:

Address

FIGURE 8-4
MEDICAL SURVEILLANCE LETTER

The following statements must be typed on company letterhead and signed by an officer of the company:

LOGO
XYZ CORPORATION
555 E. 5th Street
Nowheresville, Kansas 55555

Month, day, year

Mr. David D. Brayack
Project Manager
Tetra Tech NUS, Inc.
661 Andersen Drive
Pittsburgh, Pennsylvania 15220

Subject: HAZWOPER Medical Surveillance for NWIRP, Calverton, New York

Dear Mr. Brayack:

As an officer of XYZ Corporation, I hereby state that the persons listed below participate in a medical surveillance program meeting the requirements contained in paragraph (f) of Title 29 of the Code of Federal Regulations (CFR) Part 1910.120, entitled "Hazardous Waste Operations and Emergency Response. I further state that the persons listed below have had physical examinations under this program within the past 12 months and that they have been cleared, by a license physician, to perform hazardous waste site work and to wear positive- and negative-pressure respiratory protection. I also state that, to my knowledge, no person listed below has any medical restriction that would preclude him/her from working at the NWIRP Calverton facility.

LIST OF FULL NAMES OF EMPLOYEES AND THEIR SOCIAL SECURITY NUMBERS HERE.

Should you have any questions, please contact me at (555) 555-5555

Sincerely,

(Name and Title of Company Officer)

9.0 SITE CONTROL

This section outlines the means by which TtNUS will delineate work zones and use these work zones in conjunction with decontamination procedures to prevent the spread of contaminants into previously unaffected areas of the site. It is anticipated that a three-zone approach will be used during work at this site: Exclusion Zone, Contamination Reduction Zone, and Support Zone. It is also anticipated that this control measure will be used to control access to site work areas. Use of such controls will restrict the general public, minimize potentials for the spread of contaminants and to protect individuals who are not cleared to enter the work areas.

9.1 EXCLUSION ZONE

The Exclusion Zone will be considered those areas of the site of known or suspected contamination. It is not anticipated that significant amounts of surface contamination are in the proposed work areas of this site. It is anticipated that this will remain so until/unless contaminants are brought to the surface by intrusive activities such as excavation operations. Furthermore, once such activities have been completed and surface contamination has been removed, the potential for exposure is again diminished and the area can then be reclassified as part of the Contamination Reduction Zone. Therefore, the Exclusion Zones for this project will be limited to those areas if the site where active work is being performed plus so many feet surrounding the point of operation (See Table 5-1 for specific operation). The Exclusion Zone for this activity will represent the areas where the soils are disturbed through excavation operations and sampling activities. All Exclusion Zones will be delineated (e.g., barrier tape, cones and/or postings) to inform and direct facility personnel.

9.1.1 Exclusion Zone Clearance

A pre-startup site visit will be conducted by members of the field team in an effort to identify proposed subsurface investigation locations, conduct utility clearances, and provide up-front notices concerning scheduled activities within the facility. In all cases, no subsurface activities will proceed without utility clearance and all activities must follow the TtNUS SOP for Utility Locating and Excavation Clearance. In the event that a utility is struck during a subsurface investigative activity, the emergency numbers provided in Table 2-1 will be notified.

If any other personnel are working within the proximity of this investigation, they will be moved or their operation temporarily discontinued to remove them from potential hazards associated with this operation.

The exclusion zone will be considered those areas of active operations plus an established safety zone depending on the task. The following represent the exclusion zone boundaries for the following identified tasks:

- Excavation Operations – The boundary perimeter will be established by determining the length and width of the excavation plus a distance surrounding the excavation where the stockpiled soils will be kept. Initially the exclusion zone will be the distance of the boom, plus ten feet.
- Decontamination (heavy equipment – steam/pressure washers) – 35 feet surrounding the point of operation. This will take place at a centralized location.

Exclusion zones will be delineated using barrier tape, cones and/or drive poles, and postings to inform and direct facility site personnel and visitors, as necessary.

9.2 CONTAMINATION REDUCTION ZONE

The Contamination Reduction Zone (CRZ) will be a buffer area between the Exclusion Zone and any area of the site where contamination is not suspected. This area will also serve as a focal point in supporting Exclusion Zone activities. This area will be delineated using barrier tape, cones, and postings to inform and direct facility personnel. Decontamination will be conducted at a central location. All equipment potentially contaminated will be bagged and taken to that location for decontamination.

9.3 SUPPORT ZONE

The Support Zone for this project will include a staging area where site vehicles will be parked, equipment will be unloaded, and where food and drink containers will be maintained. In all cases, the Support Zones will be established at areas of the site where exposure to site contaminants would not be expected during normal working conditions or foreseeable emergencies.

9.4 SAFE WORK PERMITS

All Exclusion Zone work conducted in support of this project will be performed using Safe Work Permits to guide and direct field crews on a task by task basis. An example of the Safe Work Permit to be used is illustrated in Figure 9-1. Partially completed Permits for the work to be performed are included in Attachment IV. The daily meetings conducted at the site will further support these work permits. This effort will ensure all site-specific considerations and changing conditions are incorporated into the planning effort. All permits will require the signature of the FOL and SSO.

Use of these permits will provide the communication line for reviewing protective measures and hazards associated with each operation. This HASP will be used as the primary reference for selecting levels of protection and control measures. The work permit will take precedence over the HASP when more conservative measures are required based on specific site conditions.

iii. Onsite inspection conducted	Yes	No	Initials of Inspector	<u>TtNUS</u>	<u>NWIRP</u>
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9.5 SITE VISITORS

Site visitors for the purpose of this document are identified as representing the following groups of individuals:

- Personnel invited to observe or participate in operations by TtNUS
- Regulatory personnel (DOD, OSHA, etc.)
- Northern Division Navy Personnel
- Other authorized visitors

It is not anticipated that this operation will result in a large number of site visitors. However, as some visitors can reasonably be expected, the following requirements will be enforced:

- All site visitors will be routed to the FOL, who will sign them in to the field logbook. Information to be recorded in the logbook will include the individual's name (proper identification required), who they represent, and purpose for the visit.
- All site visitors will be required to produce the necessary information supporting clearance onto the site. This includes information attesting to applicable training (40-hours of HAZWOPER training required for all Northern Division Navy personnel) and medical surveillance, as stipulated in Section 8 of this document. In addition, to enter the site's operational zones during planned activities, all visitors will be required to first go through site-specific training covering the topics stipulated in Section 8.2 of this document.

NOTE: All site visitors will be escorted at all times while at the site.

Following this, the site visitor will be permitted to enter the site and applicable operational areas. All visitors are required to observe the protective equipment and site restrictions in effect at the area of their visit. Any and all visitors not meeting the requirements as stipulated in this plan for site clearance will not be permitted to enter the site operational zones during planned activities. Any incidence of unauthorized site visitation will cause all onsite activities to be terminated until that visitor can be removed. Removal of unauthorized visitors will be accomplished with support from the NWIRP Calverton Contact and, if necessary, the Riverhead Police Department.

9.6 SITE SECURITY

Site security will be accomplished using TtNUS field personnel. TtNUS will retain complete control over active operational areas. As this activity takes place at a closed Navy facility it is possible to encounter

unexpected individuals due to the relaxed security. Therefore, the first line of security will take place using Exclusion Zone barriers, and any existing barriers at the sites to restrict unauthorized access.. The second line of security will take place at the work site referring interested parties to the FOL or designee. The FOL will serve as a focal point for all non-project interested parties, and serve as the final line of security and the primary enforcement contact will be the Riverhead Police Department.

9.7 SITE MAP

Once the areas of contamination, access routes, topography, and dispersion routes are determined, a site map will be generated and adjusted as site conditions change. When possible, these maps will be posted to illustrate up-to-date collection of contaminants and adjustment of zones and access points.

9.8 BUDDY SYSTEM

Personnel engaged in on site activities will practice the "buddy system" to ensure the safety of all personnel involved in this operation.

9.9 MATERIAL SAFETY DATA SHEET (MSDS) REQUIREMENTS

TtNUS and subcontractor personnel will provide MSDSs for all chemicals brought on site. The contents of these documents will be reviewed by the SSO with the user(s) of the chemical substances prior to any actual use or application of the substances on site. A chemical inventory of all chemicals used on site will be developed using the Health and Safety Guidance Manual. The MSDSs will then be maintained in a central location (i.e., temporary office) and will be available for anyone to review upon request.

9.10 COMMUNICATION

As personnel will be working in proximity to one another during field activities, a supported means of communication between field crews members will not be necessary. External communication will be accomplished by using the telephones at predetermined and approved locations. External communication will primarily be used for the purpose of resource and emergency resource communications. Prior to the commencement of activities, the FOL will determine and arrange for telephone communications.

10.0 SPILL CONTAINMENT PROGRAM

10.1 SCOPE AND APPLICATION

It is not anticipated that bulk hazardous materials (over 55-gallons) will be handled at any given time as part of this scope of work. It is also not anticipated that such spillage would constitute a danger to human health or the environment. However, as the job progresses, the potential may exist for accumulating Investigative Derived Wastes (IDW) such as decontamination fluids, soil cuttings, and purge and well development waters, in a central staging area. Once these fluids and other materials have been characterized, they can be removed from this area and properly disposed.

10.2 POTENTIAL SPILL AREAS

Potential spill areas will be periodically monitored in an ongoing attempt to prevent and control further potential contamination of the environment. Currently, limited areas are vulnerable to this hazard including:

- Resource deployment
- Waste transfer
- Central staging

It is anticipated that all IDW generated as a result of this scope of work will be containerized, labeled, and staged to await further analyses. The results of these analyses will determine the method of disposal.

10.3 LEAK AND SPILL DETECTION

To establish an early detection of potential spills or leaks, a periodic walk-around by the personnel staging or disposing of drums or in the resource deployment area will be conducted during working hours to visually determine that storage vessels are not leaking. If a leak is detected, the contents will be transferred, using a hand pump, into a new vessel. The leak will be collected and contained using absorbents such as Oil-Dry, vermiculite, or sand, which are stored at the vulnerable areas in a conspicuously marked drum. This used material, too, will be containerized for disposal pending analysis. All inspections will be documented in the project logbook.

10.4 PERSONNEL TRAINING AND SPILL PREVENTION

All personnel will be instructed in the procedures for incipient spill prevention, containment, and collection of hazardous materials in the site-specific training. The FOL and the SSO will serve as the Spill Response Coordinators for this operation, should the need arise.

10.5 SPILL PREVENTION AND CONTAINMENT EQUIPMENT

The following represents the minimum equipment that may be maintained (depending on anticipated need) at the staging areas at all times for the purpose of supporting this Spill Prevention/Containment Program.

- Sand, clean fill, vermiculite, or other non combustible absorbent (Oil-dry)
- Drums (55-gallon U.S. DOT 17-E or 17-H)
- Shovels, rakes, and brooms

10.6 SPILL CONTROL PLAN

This section describes the procedures the TtNUS field crewmembers will employ upon the detection of a spill or leak.

1. Notify the SSO or FOL immediately upon detection of a leak or spill. Activate emergency alerting procedures for that area to remove all non-essential personnel.
2. Employ the personal protective equipment stored at the staging area. Take immediate actions to stop the leak or spill by plugging or patching the container or raising the leak to the highest point in the vessel. Spread the absorbent material in the area of the spill, covering it completely.
3. Transfer the material to a new vessel; collect and containerize the absorbent material. Label the new container appropriately. Await analyses for treatment and disposal options.
4. Recontainerize spills, including top cover impacted by the spill. Await test results for treatment or disposal options.

It is not anticipated that a spill will occur that the field crew cannot handle. Should this occur, notification of the appropriate Emergency Response agencies will be carried out by the FOL or SSO in accordance with the procedures discussed in Section 2.0 of this HASP.

11.0 CONFINED-SPACE ENTRY

It is not anticipated, under the proposed scope of work, that confined space and permit-required confined space activities will be conducted. **Therefore, personnel under the provisions of this HASP are not allowed, under any circumstances, to enter any confined spaces.** A confined space is defined as an area which has one or more of the following characteristics:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.
- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).
- Is not designed for continuous employee occupancy.

A Permit-Required Confined Space is one that:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section.
- Contains any other recognized, serious, safety or health hazard.

For further information on confined space, consult the Health and Safety Guidance Manual or call the PHSO. If confined space operations are to be performed as part of the scope of work, detailed procedures and training requirements will have to be addressed.

12.0 MATERIALS AND DOCUMENTATION

The TtNUS FOL shall ensure the following materials/documents are taken to the project site and used when required.

- A complete copy of this HASP
- Health and Safety Guidance Manual
- Incident Reports
- Medical Data Sheets
- Material Safety Data Sheets for all chemicals brought on site, including decon solution, fuels, sample preservations, calibration gases, etc.
- Follow-up Reports (to be completed by the FOL)
- A full size OSHA Job Safety and Health Poster
- Training/Medical Surveillance Documentation Form (blank)
- First-Aid Supply Usage Form
- Emergency Reference Form (Section 2.0, extra copy for posting)

12.1 MATERIALS TO BE POSTED AT THE SITE

The following documentation is to be posted or maintained at the site for quick reference purposes. In situations where posting these documents is not feasible, (such as no office trailer), these documents should be separated and immediately accessible.

Chemical Inventory Listing (posted) - This list represents all chemicals brought on-site, including decontamination solutions, sample preservations, fuel, etc.. This list should be posted in a central area.

Material Safety Data Sheets (MSDS) (maintained) - The MSDSs should also be in a central area accessible to all site personnel. These documents should match all the listings on the chemical inventory

list for all substances employed on-site. It is acceptable to have these documents within a central folder and the chemical inventory as the table of contents.

The OSHA Job Safety & Health Protection Poster (posted) - this poster, as directed by 29 CFR 1903.2 (a)(1), should be conspicuously posted in places where notices to employees are normally posted. Each FOL shall ensure that this poster is not defaced, altered, or covered by other material.

Site Clearance (maintained) - This list is found within the training section of the HASP (See Figure 8-2). This list identifies all site personnel, dates of training (including site-specific training), and medical surveillance. The lists indicates not only clearance but also status. If personnel do not meet these requirements, they do not enter the site while site personnel are engaged in activities.

Emergency Phone Numbers and Directions to the Hospital(s) (posted) - This list of numbers and directions will be maintained at all phone communications points and in each site vehicle.

Medical Data Sheets/Cards (maintained) - Medical Data Sheets will be filled out by on-site personnel and filed in a central location. The Medical Data Sheet will accompany any injury or illness requiring medical attention to the medical facility. a copy of this sheet or a wallet card will be given to all personnel to be carried on their person.

Hearing Conservation Standard (29 CFR 1910.95) (posted) - this standard will be posted anytime hearing protection or other noise abatement procedures are employed.

Personnel Monitoring (maintained) - All results generated through personnel sampling (levels of airborne toxins, noise levels, etc.) will be posted to inform individuals of the results of that effort.

Placards and Labels (maintained) - Where chemical inventories have been separated because of quantities and incompatibilities, these areas will be conspicuously marked using DOT placards and acceptable (Hazard Communication 29 CFR 1910.1200(f)) labels.

The purpose, as stated above, is to allow site personnel quick access to this information. Variations concerning location and methods of presentation are acceptable, providing the objection is accomplished.

13.0 GLOSSARY

ACGIH	American Conference of Governmental Industrial Hygienists
APR	Air Purifying Respirator
BGS	Below Ground Surface
C	Centigrade
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CLEAN	Comprehensive Long-term Environmental Action - Navy
CNS	Central Nervous System
CRZ	Contamination Reduction Zone
CSP	Certified Safety Professional
CTO	Contract Task Order
CZR	Contamination Reduction Zone
dBA	Decibel
DoD	Department of Defense
DOT	Department of Transportation
DPT	Direct Push Technology
ECM	Electronic Measures Area
EPA	Environmental Protection Agency
eV	electron Volts
F	Fahrenheit
FID	Flame Ionization Detector
FOL	Field Operations Leader
GC	Gas Chromatograph
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HEPA	High Efficiency Particulate Air
HSM	Health and Safety Manager
IARC	International Agency for Research on Cancer
IAS	Initial Assessment Study
IDLH	Immediate Dangerous to Life or Health
IDW	Investigative Derived Waste
IP	Ionization Potential
IR	Installation Restoration
LEL/LFL	Lower Explosive Limit / Lower Flammable Limit

mg/m ³	Milligrams per cubic meter
mmHg	millimeters mercury
MSDS	Material Safety Data Sheet
msl	mean sea level
MWIRP	Naval Weapons Industrial Reserve Plant
N/A	Not Available
NIOSH	National Institute of Occupational Safety and Health
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor)
PAH	Polynuclear Hydrocarbons
PE	Professional Engineer
PEL	Permissible Exposure Limit
PHSO	Project Health and Safety Officer
PID	Photoionization Detector
PPE	Personal Protective Equipment
PPM	Parts per Million
Pt	Point
PVC	Polyvinyl Chloride
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
SAP	Sampling and Analyses Plan
SAR	Supplied Air Respirator
SCBA	Self Contained Breathing Apparatus
SI	Site Investigation
SOP	Standard Operating Procedure
SSO	Site Safety Officer
SSO	Site Safety Officer
STEL	Short Term Exposure Limit
SVOC	Semivolatile Organic Compound
TBD	To be determined
TLV	Threshold Limit Value
PM	Project Manager
TtNUS	Tetra Tech NUS, Inc.
TWA	Time-Weighted Average
UEL/UFL	Upper Explosive Limit/Upper Flammable Limit
USGS	United States Geological Survey
VOC	Volatile Organic Compound
WP	Work Plan

ATTACHMENT I

INJURY/ILLNESS PROCEDURE AND REPORT FORM



CASE NO. _____

TETRA TECH NUS, INC.

INJURY/ILLNESS PROCEDURE WORKER'S COMPENSATION PROGRAM

WHAT YOU SHOULD DO IF YOU ARE INJURED OR DEVELOP AN ILLNESS AS A RESULT OF YOUR EMPLOYMENT:

- If injury is minor, obtain appropriate first aid treatment.
- If injury or illness is severe or life threatening, obtain professional medical treatment at the nearest hospital emergency room.
- If incident involves a chemical exposure on a project work site, follow instructions in the Health & Safety Plan.
- Immediately report any injury or illness to your supervisor or office manager. In addition, you must contact your Human Resources representative, Marilyn Diethorn at (412) 921-8475, and the Corporate Health and Safety Manager, Matt Soltis at (412) 921-8912 within 24 hours. You will be required to complete an Injury/Illness Report (attached). You may also be required to participate in a more detailed investigation from the Health Sciences Department.
- If further medical treatment is needed, The Hartford Network Referral Unit will furnish a list of network providers customized to the location of the injured employee. These providers are to be used for treatment of Worker's Compensation injuries subject to the laws of the state in which you work. Please call Marilyn Diethorn at (412) 921-8475 for the number of the Referral Unit.

ADDITIONAL QUESTIONS REGARDING WORKER'S COMPENSATION:

Contact your local human resources representative, corporate health and safety coordinator, or Corporate Administration in Pasadena, California, at (626) 351-4664.

Worker's compensation is a state-mandated program that provides medical and disability benefits to employees who become disabled due to job related injury or illness. Tetra Tech, Inc. and its subsidiaries (Tetra Tech or Company) pay premiums on behalf of their employees. The type of injuries or illnesses covered and the amount of benefits paid are regulated by the state worker's compensation boards and vary from state to state. Corporate Administration in Pasadena is responsible for administering the Company's worker's compensation program. The following is a general explanation of worker's compensation provided in the event that you become injured or develop an illness as a result of your employment with Tetra Tech or any of its subsidiaries. Please be aware that the term used for worker's compensation varies from state to state.

WHO IS COVERED:

All employees of Tetra Tech, whether they are on a full-time, part-time or temporary status, working in an office or in the field, are entitled to worker's compensation benefits. All employees must follow the above injury/illness reporting procedures. Consultants, independent contractors, and employees of subcontractors are not covered by Tetra Tech's Worker's Compensation plan.



CASE NO. _____

WHAT IS COVERED:

If you are injured or develop an illness caused by your employment, worker's compensation benefits are available to you subject to the laws of the state you work in. Injuries do not have to be serious; even injuries treated by first aid practices are covered and must be reported. Please note that if you are working out-of-state and away from your home office, you are still eligible for worker's compensation benefits.



CASE NO. _____

TETRA TECH NUS, INC.
INJURY/ILLNESS PROCEDURE
WORKER'S COMPENSATION PROGRAM

To: Corporate Health and Safety Manager
Human Resource Administrator

Prepared by: _____

Position: _____

Project Name: _____

Office: _____

Project No. _____

Telephone: _____

Information Regarding Injured or Ill Employee:

Name: _____

Office: _____

Home address: _____

Gender: M ☐ F ☐ No. of dependents: _____

Marital status: _____

Home telephone: _____

Date of birth: _____

Occupation (regular job title): _____

Social Security No.: _____

Department: _____

Date of Accident: _____**Time of Accident:** _____**Location of Accident**

Was place of accident or exposure on employer's premises

Yes ☐ No ☐

Street address: _____

City, state, and zip code: _____

County: _____

Narrative Description of How Accident Occurred: (Be specific. Explain what the employee was doing and how the accident occurred.)



TETRA TECH, INC.
INJURY/ILLNESS REPORT

Did employee die? Yes ☐ No ☐

Was employee performing regular job duties? Yes ☐ No ☐

Was safety equipment provided? Yes ☐ No ☐

Was safety equipment used? Yes ☐ No ☐

Note: Attach any police reports or related diagrams to this accident report.

Witness(es):

Name:

Address:

Telephone:

Describe the Illness or Injury and Part of Body Affected:

Name the Object or Substance which Directly Injured the Employee:

Medical Treatment Required:

☐ No ☐ Yes ☐ First Aid Only

Physician's Name: _____

Address: _____

Hospital or Office Name: _____

Address: _____

Telephone No.: _____

Lost Work Days:

☐ No. of Lost Work Days _____

Last Date Worked _____

Time Employee Left Work _____

Date Employee Returned to Work _____

☐ No. of Restricted Work Days _____

☐ None

Corrective Action(s) Taken by Unit Reporting the Accident:

Corrective Action Still to be Taken (by whom and when):

Name of Tetra Tech employee the injury or illness was first reported to: _____

Date of Report: _____ **Time of Report:** _____

	Printed Name	Signature	Telephone No.	Date
Project or Office Manager				
Site Safety Coordinator				
Injured Employee				

To be completed by Human Resources:

Date of hire:

Hire date in current job:

Wage information: \$ _____ per _____ (hour, day, week, or month)

Position at time of hire:

Shift hours:

State in which employee was hired:

Status: ☐ Full-time ☐ Part-time **Hours per week:** _____ **Days per week:** _____

Temporary job end date:

To be completed during report to workers' compensation insurance carrier:

Date reported:

Reported by:

TeleClaim phone number:

TeleClaim account number:

Location code:

Confirmation number:

Name of contact:

Field office of claims adjuster:

ATTACHMENT II

TICK CONTROL AND LYME DISEASE

TICK CONTROL AND LYME DISEASE

The occurrence of Lyme disease has become a worldwide problem since its identification in 1976. This disease is characteristically recognized as being transmitted by ticks, which may be encountered by field personnel while working at this site. As a result, this discussion has been included with this Health and Safety Plan to provide for adequate recognition, evaluation, and control efforts to minimize the occurrence and effects of this potential hazard.

The discovery of Lyme disease is credited to Dr. Allen Steere of Yale University Medical School, and is named after the community where it was (reportedly) first encountered, Lyme, Connecticut. This disease can be transmitted to man through the bite of ticks that are infected with a cork screw-shaped microbe (spirochete). The spread of this disease has been so rapid that in 1984 it surpassed Rocky Mountain Spotted fever as the most common tick-borne disease in the United States. In this country, most of the incidents of this disease have been recorded in the Northeast, and the tick species most commonly attributed with its spread is the deer tick.

Recognition

This hazard potential exists primarily in the spring and summer months, as these are the seasons that tick populations and activity flourish. In fact, 90 percent of the reported cases have occurred from early June through September. Also, this concern exists primarily in heavily vegetated areas. Therefore, recognition of these factors can aid in the awareness and control of this threat.

To aid in the recognition and identification of these insects, an example illustration of the tick species common to the region where this site is located has been included with this discussion. This species (the American Dog tick) is common in the eastern half of the United States, and typically exists in areas covered with grass or underbrush. These insects will attach themselves to animals (including man) that pass through the area and rub against them. After finding a host, the tick inserts its mouthparts and sucks blood until it is fully engorged. This requires a time period of three to twelve days, then the tick will drop off. In addition to Lyme disease concerns, this tick has also been identified as a transmitter of Rocky Mountain Spotted Fever, and the organisms of tularemia and possibly relapsing fever. The wounds left by tick bites can be painful, and can also have a paralyzing effect commonly referred to as tick paralysis.

The earliest symptom of the onset of this disease is the occurrence of an unusual red skin rash. This is commonly the first indication since it has been evidenced that many persons who have contracted this disease were, in fact, unaware that they had been bitten. This rash can appear at the site of the bite anywhere from several days to a few weeks after the bite. It typically starts as a small red spot, and then expands as the spirochetes expand from the bite location. Rash sizes can vary, but have been most commonly associated in a 2 to 3 inch diameter size range. This rash will fade (with or without treatment) after a few weeks. Close inspection is necessary to detect this symptom as the rashes are easy to miss because they're often very faint. Body sites where rashes frequently occur include the thigh areas, groin, and armpits. Also, it is not uncommon for a rash to develop in more than one place.

Other early symptoms include profound fatigue, a stiff neck, and flu-like symptoms such as headache, chills, fever, and muscle aches. Recognition of the onset of any of these symptoms is important since tick bites do not always produce a rash. If left untreated, the disease will progress to its second stage within weeks or months after the infection. This stage involves affects to the heart and nervous system. A common second stage symptom is a paralysis on one or both sides of the face. Others include severe headache, encephalitis, or meningitis. The third and final stage involves the development of chronic inflammatory arthritis, which can occur up to a year or more after the bite.

Evaluation

Evaluation of this hazard potential principally involves field personnel performing close self-inspections for the presence of ticks each time they leave the site. This should involve careful examination; especially of the individuals' heads. Personnel should be aware that when a tick attaches itself to its host, it inserts its entire head under the surface of the skin.

Control

Control of this threat involves several components. First, field personnel must be aware of the climate and area conditions which are commonly associated with being conducive to tick infestation. Second, when working in or walking through potential infested areas, personnel must ensure that they do not have exposed body parts (i.e. at least long sleeved shirts and long pants, particularly when protective coveralls are not worn). In heavily vegetated areas where infestation is likely, Tyvek coveralls will be required to minimize this hazard potential. Also, several commercial products have been demonstrated as being effective in repelling ticks. Examples include Permanone, Off!, and Cutter. These types of repellents will be used at the direction and discretion of the Tetra Tech NUS Health and Safety Officer, and only in accordance and observation of manufacturer's recommendations. In most instances, however, such repellents are typically applied to the outside surfaces of clothing (and not directly onto the skin), and should be applied also to shoe tops, socks, pants cuffs, and other areas most susceptible to ticks.

Tick Removal

In the event that a tick is discovered to be attached to a member of the field team, timely removal of the insect is critical to reducing the potential for contracting the disease. According to available information and research, there is apparently a grace period of at least a few hours from the time of the bite before the tick transmits the microbe (the spiróchetes are not present in the mouth parts of the tick). However, the incident of a tick bite is frequently unnoticed, and the discovery of the tick may not occur until after this suspected grace period has already elapsed. Therefore, timely removal is very important. The preferred method of tick removal is to pull it out using tweezers or small forceps. In this method, the tick should be grasped as close to the mouth as possible, and then pulled steadily upward. Care must be exercised so as not to pull in a jerking motion as this can result in the head becoming detached. After the tick has been removed, disinfect the bite with rubbing alcohol or povidone iodine (Betadine). The tick must not be handled as the microbes can enter the body through any breaks in intact skin. The bite should be checked occasionally for at least a two-week period to see if a rash forms. If it does, medical attention must be promptly sought.

In order to provide for proper and timely response to the occurrence of a tick bite, the SSO will ensure that the site First Aid kit is properly equipped with medical forceps and rubbing alcohol, in addition to the standard kit contents. Also, an adequate supply of commercial insect (tick) repellents will be maintained on-site, and all personnel will be trained in its proper application and will be required to use it, at the direction of FOL.

ATTACHMENT III

EQUIPMENT INSPECTION CHECKLIST

EQUIPMENT INSPECTION

COMPANY: _____ **UNIT NO.** _____
FREQUENCY: Inspect daily, document prior to use and as repairs are needed.

Inspection Date: ____/____/____ Time: _____ Equipment Type: _____
(e.g., bulldozer)

	Good	Need Repair	N/A
Tires or tracks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hoses and belts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cab, mirrors, safety glass	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the equipment equipped with audible back-up alarms and back-up lights?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Horn and gauges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brake condition (dynamic, park, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fire extinguisher (Type/Rating - _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fluid Levels:			
- Engine oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Transmission fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Brake fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Cooling system fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Windshield wipers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Hydraulic oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oil leak/lube	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coupling devices and connectors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exhaust system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blade/boom/ripper condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accessways: Frame, hand holds, ladders, walkways (non-slip surfaces), guardrails?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power cable and/or hoist cable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Steering (standard and emergency)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Safety Guards:

Yes No

- Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Hot pipes and surfaces exposed to accidental contact? _____	<input type="checkbox"/>	<input type="checkbox"/>
- All emergency shut offs have been identified and communicated to the field crew? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Have emergency shutoffs been field tested? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Results? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Are any structural members bent, rusted, or otherwise show signs of damage? _____	<input type="checkbox"/>	<input type="checkbox"/>
- Are fueling cans used with this equipment approved type safety cans? _____	<input type="checkbox"/>	<input type="checkbox"/>

- Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use? _____ ☐ ☐

Portable Power Tools:

- Tools and Equipment in Safe Condition? _____ ☐ ☐
- Saw blades, grinding wheels free from recognizable defects (grinding wheels have been sounded)? _____ ☐ ☐
- Portable electric tools properly grounded? _____ ☐ ☐
- Damage to electrical power cords? _____ ☐ ☐
- Blade guards in place? _____ ☐ ☐
- Components adjusted as per manufacturers recommendation? _____ ☐ ☐

Cleanliness:

- Overall condition (is the decontamination performed prior to arrival on-site considered acceptable)? _____
- Where was this equipment used prior to its arrival on site? _____
- Site Contaminants of concern at the previous site? _____
- Inside debris (coffee cups, soda cans, tools and equipment) blocking free access to foot controls? _____

Operator Qualifications (as applicable for all heavy equipment):

- Does the operator have proper licensing where applicable, (e.g., CDL)? _____
- Does the operator, understand the equipments operating instructions? _____
- Is the operator experienced with this equipment? _____
- Does the operator have emotional and/or physical limitations which would prevent him/her from performing this task in a safe manner? _____
- Is the operator 21 years of age or more? _____

Identification:

- Is a tagging system available, for positive identification, for tools removed from service? _____

Additional Inspection Required Prior to Use On-Site

- | | Yes | No |
|---|--------------------------|--------------------------|
| - Does equipment emit noise levels above 90 decibels? | <input type="checkbox"/> | <input type="checkbox"/> |
| - If so, has an 8-hour noise dosimetry test been performed? | <input type="checkbox"/> | <input type="checkbox"/> |
| - Results of noise dosimetry: _____ | | |
| - Defects and repairs needed: _____ | | |
| - General Safety Condition: _____ | | |
| - Operator or mechanic signature: _____ | | |
- Approved for Use: ☐ Yes ☐ No

Site Safety Officer Signature

ATTACHMENT IV

SAFE WORK PERMITS

**SAFE WORK PERMIT FOR
MOBILIZATION AND DEMOBILIZATION ACTIVITIES
AT NWIRP, CALVERTON, NEW YORK – CTO 0223**

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. Work limited to the following (description, area, equipment used): Mobilization and demobilization activities at Site 6A (Fuel Calibration Area) and 2 (Fire Training Area).

II. Required Monitoring Instruments: None

III. Field Crew: _____

IV. On-site inspection conducted ☐ Yes ☐ No Initials of Inspector TINUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

IV Protective equipment required

Level D ☒ Level B ☐

Level C ☐ Level A ☐

Detailed on Reverse

Respiratory equipment required

Full face APR ☐

Half face APR ☐

SKA-PAC SAR ☐

Skid Rig ☐

Escape Pack ☐

SCBA ☐

Bottle Trailer ☐

None ☒

Modifications/Exceptions: Minimum requirement include sleeved shirt and long pants, safety glasses and safety footwear. Hard hats and hearing protection will be worn when working near operating equipment.

V. Chemicals of Concern

Action Level(s)

Response Measures

None anticipated given the

nature of surveying activities

and limited contact w/ media.

VI. Additional Safety Equipment/Procedures

Hard-hat.....

☐ Yes ☒ No

Safety Glasses

☒ Yes ☐ No

Chemical/splash goggles.....

☐ Yes ☒ No

Splash Shield.....

☐ Yes ☒ No

Splash suits/coveralls

☐ Yes ☒ No

Steel toe Work shoes or boots

☒ Yes ☐ No

Hearing Protection (Plugs/Muffs) ☐ Yes ☒ No

Safety belt/harness ☐ Yes ☒ No

Radio ☐ Yes ☒ No

Barricades ☐ Yes ☒ No

Gloves (Type - Nitrile) ☐ Yes ☒ No

Work/rest regimen ☐ Yes ☒ No

Modifications/Exceptions: Reflective vests for high traffic areas. Tyvek coverall to protect against natural hazards (e.g., ticks).

VII. Procedure review with permit acceptors

Yes NA

Yes NA

Safety shower/eyewash (Location & Use)

☐ ☐

Emergency alarms

☐ ☐

Procedure for safe job completion

☐ ☐

Evacuation routes

☐ ☐

Contractor tools/equipment/PPE inspected

☐ ☐

Assembly points.....

☐ ☐

VIII. Equipment Preparation

Yes NA

Equipment drained/depressurized.....

☐ ☐

Equipment purged/cleaned.....

☐ ☐

Isolation checklist completed.....

☐ ☐

Electrical lockout required/field switch tested.....

☐ ☐

Blinds/misalignments/blocks & bleeds in place

☐ ☐

Hazardous materials on walls/behind liners considered.....

☐ ☐

IX. Additional Permits required (Hot work, confined space entry, excavation etc.)..... ☐ Yes ☐ No

If yes, complete permit required or contact Health Sciences, Pittsburgh Office

X. Special instructions, precautions: Preview work locations to identify potential hazards (slips, trips, and falls, natural hazards, etc.) Avoid potential nesting areas. Wear light colored clothing so that ticks and other biting insects can be easily visible and can be removed. Inspect clothing and body for ticks. Minimize contact with potentially contaminated media. Suspend site activities in the event of inclement weather.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT FOR
EXCAVATION OPERATIONS
NWIRP CALVERTON, NEW YORK – CTO 0223**

Permit No. _____ Date: _____ Time: From _____ to _____

I: General Job Scope

I. Work limited to the following (description, area, equipment used): Excavation activities at Site 6A (Fuel Calibration Area and Site 2 (Fire Training Area)

II. Required Monitoring Instruments: PID with 10.6 eV lamp or FID

III. Field Crew: _____

IV. On-site Inspection conducted ☐ Yes ☐ No Initials of Inspector _____
TtNUS

V: General Safety Requirements (To be filled in by permit issuer)

Protective equipment required

Level D ☒ Level B ☐
Level C ☐ Level A ☐
Detailed on Reverse

Respiratory equipment required

Full face APR ☐ Escape Pack ☐
Half face APR ☐ SCBA ☐
SAR ☐ Bottle Trailer ☐
Skid Rig ☐ None ☒

Level D Minimum Requirements: Sleeved shirt and long pants and safety footwear. Safety glasses, hard hats, and hearing protection will be worn when working in the vicinity of the back-hoe.

V Chemicals of Concern

Action Level(s)

Response Measures

Potential site contaminants

< 10 ppm

Perform continuous B.Z. monit.

include VOCs associated with fuels
and solvents

> 10 ppm

Report to an unaffected area
notify PHSO / HSM

VI. Additional Safety Equipment/Procedures

Hard-hat	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Hearing Protection (Plugs/Muffs) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Safety Glasses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Chemical/splash goggles	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Radio <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash Shield	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Splash suits/coveralls	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Gloves (Type - Nitrile) <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Steel toe Work shoes or boots	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Work/rest regimen <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Modifications/Exceptions: Nitrile gloves if handling soils and/or free product. Reflective vests for work near backhoe. Tyvek or PVC or PE coated Tyvek if saturation or soiling of work clothes may occur. Impermeable boot covers if shoes may be soiled. No excavations will be left open and/or unattended. Those to be left open will be barricaded and signs placed indicating open excavations. No personnel will enter any excavation.

VII. Procedure review with permit acceptors

Yes NA

Yes NA

Safety shower/eyewash (Location & Use).....☒ ☐

Emergency alarms.....☒ ☐

Procedure for safe job completion.....☐ ☐

Evacuation routes.....☒ ☐

Contractor tools/equipment/PPE inspected.....☒ ☐

Assembly points.....☒ ☐

VIII. Site Preparation

Utility Clearances obtained for areas of subsurface investigation

☒ Yes ☐ No

IX. Equipment Preparation

Yes NA

Equipment drained/depressurized.....☐ ☒

Equipment purged/cleaned.....☐ ☒

Isolation checklist completed.....☐ ☒

Electrical lockout required/field switch tested.....☐ ☒

Blinds/misalignments/blocks & bleeds in place.....☐ ☒

Hazardous materials on walls/behind liners considered.....☐ ☒

X. Additional Permits required (excavation).....☒ Yes ☐ No

If yes, complete permit required or contact Health Sciences, Pittsburgh Office

XI. Special instructions, precautions: Excavation will be conducted in accordance with 29 CFR 1926.650-.652 concerning sloping, shoring, storage, and movement on or over excavations. Equipment, personnel, and machinery will be kept away from the edges of open excavations (> 3 feet). Personnel will not be permitted to enter an excavation greater than 4 feet deep with out the use of shoring, benching or trench boxes. If any intact containers or drums are uncovered as a result of excavation activities, site operations will be suspended and the FOL or SSO notified.

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT FOR
MULTI-MEDIA SAMPLING
NWIRP, CALVERTON, NEW YORK – CTO 0223**

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. Work limited to the following (description, area, equipment used): Multi-media sampling (subsurface soils) with the possibility of additional samples of liquids and free product.

II. Required Monitoring Instrument(s): PID w/ a 10.6 eV lamp source or FID

III. Field Crew: _____

IV. On-site Inspection conducted ☐ Yes ☐ No Initials of Inspector TINUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

IV. Protective equipment required
Level D ☒ Level B ☐
Level C ☐ Level A ☐
Detailed on Reverse

Respiratory equipment required

Full face APR	<input type="checkbox"/>	Escape Pack	<input type="checkbox"/>
Half face APR	<input type="checkbox"/>	SCBA	<input type="checkbox"/>
SAR	<input type="checkbox"/>	Bottle Trailer	<input type="checkbox"/>
Skid Rig	<input type="checkbox"/>	None	<input checked="" type="checkbox"/>

Modifications/Exceptions: Minimum requirement include sleeved shirt and long pants, safety shoes, surgical style gloves, and safety glasses. Hard hats and hearing protection will be worn when working near operating equipment or when required by the SSO. Reflective vests if working near backhoe

V. Chemicals of Concern	Action Level(s)	Response Measures
Potential site contaminants	< 10 ppm	Perform continuous B.Z. monit.
include VOCs associated with fuels and solvents	> 10 ppm	Report to an unaffected area notify PHSO / HSM

VI. Additional Safety Equipment/Procedures

Hard-hat.....	<input type="checkbox"/> Yes <input type="checkbox"/> No	Hearing Protection (Plugs/Muffs) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Safety Glasses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Chemical/splash goggles	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Radio <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash Shield	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Barricades <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash suits/coveralls	<input type="checkbox"/> Yes <input type="checkbox"/> No	Gloves (Type - Nitrile) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe Work shoes or boots	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Work/rest regimen <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Modifications/Exceptions: Reflective vests when working near backhoe. Tyvek coverall if there is a potential for soiling work cloths. SSO may dictate double-layering gloves.

VII. Procedure review with permit acceptors	Yes	NA	Emergency alarms	Yes	NA
Safety shower/eyewash (Location & Use)	<input type="checkbox"/>	<input type="checkbox"/>	Evacuation routes	<input type="checkbox"/>	<input type="checkbox"/>
Procedure for safe job completion	<input type="checkbox"/>	<input type="checkbox"/>	Assembly points	<input type="checkbox"/>	<input type="checkbox"/>
Contractor tools/equipment/PPE inspected	<input type="checkbox"/>	<input type="checkbox"/>			

VIII. Equipment Preparation	Yes	NA
Equipment drained/depressurized	<input type="checkbox"/>	<input type="checkbox"/>
Equipment purged/cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Isolation checklist completed	<input type="checkbox"/>	<input type="checkbox"/>
Electrical lockout required/field switch tested	<input type="checkbox"/>	<input type="checkbox"/>
Blinds/misalignments/blocks & bleeds in place	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous materials on walls/behind liners considered	<input type="checkbox"/>	<input type="checkbox"/>

IX. Additional Permits required (Hot work, confined space entry, excavation etc.)

☐ Yes ☐ No

If yes, complete permit required or contact Health Sciences, Pittsburgh Office

X. Special instructions, precautions: _____

Permit Issued by: _____ Permit Accepted by: _____

**SAFE WORK PERMIT FOR
DECONTAMINATION ACTIVITIES AT
NWIRP, CALVERTON, NEW YORK – CTO 0223**

Permit No. _____ Date: _____ Time: From _____ to _____

SECTION I: General Job Scope

I. Work limited to the following (description, area, equipment used): Decontamination of sampling equipment and machinery (i.e., backhoe). Brushes and spray bottles will be used to decon small sampling equipment. Pressure washers or steam cleaning units will be used to decon the backhoe.

II. Required Monitoring Instrument(s): PID with 10.6 eV lamp source (used to screen equipment)

III. Field Crew: _____

IV. On-site Inspection conducted ☐ Yes ☐ No Initials of Inspector TtNUS

SECTION II: General Safety Requirements (To be filled in by permit issuer)

IV. Protective equipment required

Level D ☒ Level B ☐
Level C ☐ Level A ☐
Detailed on Reverse

Respiratory equipment required

Full face APR ☐
Half face APR ☐
SAR ☐
Skid Rig ☐

Escape Pack ☐
SCBA ☐
Bottle Trailer ☐
None ☒

Modifications/Exceptions: Minimum requirement include sleeved shirt and long pants, safety glasses, safety footwear, and nitrile gloves. When using pressure washers, steam cleaners field crews will wear hearing protection, and face shields.

V. Chemicals of Concern	Action Level(s)	Response Measures
Potential site contaminants	< 10 ppm	Perform continuous B.Z. monit.
include VOCs associated with fuels	> 10 ppm	Report to an unaffected area
and solvents		notify PHSO / HSM

VI. Additional Safety Equipment/Procedures

Hard-hat.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hearing Protection (Plugs/Muffs) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Safety Glasses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Safety belt/harness <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Chemical/splash goggles.....	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Radio <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash Shield.....	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Barricades <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Splash suits/coveralls	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Gloves (Type - Nitrile) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Steel toe Work shoes or boots	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Work/rest regimen <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Modifications/Exceptions: PVC rain suits or PE or PVC coated Tyvek for protection against splashes and overspray. Chemical resistant boot covers if excessive liquids are generated or to protected footwear.

VII. Procedure review with permit acceptors	Yes	NA	Yes	NA
Safety shower/eyewash (Location & Use)	<input type="checkbox"/>	<input type="checkbox"/>	Emergency alarms	<input type="checkbox"/>
Procedure for safe job completion	<input type="checkbox"/>	<input type="checkbox"/>	Evacuation routes	<input type="checkbox"/>
Contractor tools/equipment/PPE inspected	<input type="checkbox"/>	<input type="checkbox"/>	Assembly points.....	<input type="checkbox"/>

VIII. Equipment Preparation

Equipment drained/depressurized.....	<input type="checkbox"/>	Yes	NA
Equipment purged/cleaned.....	<input type="checkbox"/>		
Isolation checklist completed.....	<input type="checkbox"/>		
Electrical lockout required/field switch tested.....	<input type="checkbox"/>		
Blinds/misalignments/blocks & bleeds in place	<input type="checkbox"/>		
Hazardous materials on walls/behind liners considered.....	<input type="checkbox"/>		

IX. Additional Permits required (Hot work, confined space entry, excavation etc.)..... ☐ Yes ☐ No
If yes, complete permit required or contact Health Sciences, Pittsburgh Office

X. Special instructions, precautions: Site contaminants include VOCs associated with fuels and solvents. Other chemical hazards include decontamination fluids such as isopropyl alcohol, methanol, etc. To minimize the potential for exposure, site personnel will use PPE and prevent contact with potentially contaminated equipment. Refer to the manufacturer's MSDS regarding PPE, handling, storage, and first-aid measures related to decontamination fluids.

Permit Issued by: _____ Permit Accepted by: _____

ATTACHMENT V

**STANDARD OPERATING PROCEDURE
FOR
UTILITY LOCATING AND EXCAVATION
CLEARANCE**

ATTACHMENT VI

29 CFR 1926.650 - .652

EXCAVATION STANDARD

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OSHA Regulations (Standards - 29 CFR)

Scope, application, and definitions applicable to this subpart. - 1926.650

◀ OSHA Regulations (Standards - 29 CFR) - Table of Contents

- **Standard Number:** 1926.650
 - **Standard Title:** Scope, application, and definitions applicable to this subpart.
 - **SubPart Number:** P
 - **SubPart Title:** Excavations
-

Interpretation(s)

(a)

Scope and application. This subpart applies to all open excavations made in the earth's surface. Excavations are defined to include trenches.

(b)

Definitions applicable to this subpart.

"Accepted engineering practices" means those requirements which are compatible with standards of practice required by a registered professional engineer.

"Aluminum Hydraulic Shoring" means a pre-engineered shoring system comprised of aluminum hydraulic cylinders (crossbraces) used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

"Bell-bottom pier hole" means a type of shaft or footing excavation,

the bottom of which is made larger than the cross section above to form a belled shape.

"Benching (Benching system)" means a method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

"Cave-in" means the separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or other wise injure and immobilize a person.

"Competent person" means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

"Cross braces" mean the horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

"Excavation" means any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

"Faces" or "sides" means the vertical or inclined earth surfaces formed as a result of excavation work.

"Failure" means the breakage, displacement, or permanent deformation of a structural member or connection so as to reduce its structural integrity and its supportive capabilities.

"Hazardous atmosphere" means an atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

"Kickout" means the accidental release or failure of a cross brace.

"Protective system" means a method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide

the necessary protection.

"Ramp" means an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

"Registered Professional Engineer" means a person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

"Sheeting" means the members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

"Shield (Shield system)" means a structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either premanufactured or job-built in accordance with 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

"Shoring (Shoring system)" means a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

"Sides". See "Faces."

"Sloping (Sloping system)" means a method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

"Stable rock" means natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has

been designed by a registered professional engineer.

"Structural ramp" means a ramp built of steel or wood, usually used for vehicle access. Ramps made of soil or rock are not considered structural ramps.

"Support system" means a structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

"Tabulated data" means tables and charts approved by a registered professional engineer and used to design and construct a protective system.

"Trench (Trench excavation)" means a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

"Trench box." See "Shield."

"Trench shield." See "Shield."

"Uprights" means the vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. Uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

"Wales" means horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

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OSHA Regulations (Standards - 29 CFR)

Specific Excavation Requirements. - 1926.651

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- **Standard Number:** 1926.651
 - **Standard Title:** Specific Excavation Requirements.
 - **SubPart Number:** P
 - **SubPart Title:** Excavations
-

Interpretation(s)

(a)

Surface encumbrances. All surface encumbrances that are located so as to create a hazard to employees shall be removed or supported, as necessary, to safeguard employees.

(b)

Underground installations.

(b)(1)

The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening an excavation.

(b)(2)

Utility companies or owners shall be contacted within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground

installations prior to the start of actual excavation. When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours (unless a longer period is required by state or local law), or cannot establish the exact location of these installations, the employer may proceed, provided the employer does so with caution, and provided detection equipment or other acceptable means to locate utility installations are used.

..1926.651(b)(3)

(b)(3)

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means.

(b)(4)

While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

(c)

Access and egress -

(c)(1)

Structural ramps.

(c)(1)(i)

Structural ramps that are used solely by employees as a means of access or egress from excavations shall be designed by a competent person. Structural ramps used for access or egress of equipment shall be designed by a competent person qualified in structural design, and shall be constructed in accordance with the design.

(c)(1)(ii)

Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent displacement.

(c)(1)(iii)

Structural members used for ramps and runways shall be of uniform thickness.

(c)(1)(iv)

Cleats or other appropriate means used to connect runway structural members shall be attached to the bottom of the runway or shall be attached in a manner to prevent tripping.

..1926.651(c)(1)(v)**(c)(1)(v)**

Structural ramps used in lieu of steps shall be provided with cleats or other surface treatments on the top surface to prevent slipping.

(c)(2)

Means of egress from trench excavations. A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet (1.22 m) or more in depth so as to require no more than 25 feet (7.62 m) of lateral travel for employees.

(d)

Exposure to vehicular traffic. Employees exposed to public vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material.

(e)

Exposure to falling loads. No employee shall be permitted underneath loads handled by lifting or digging equipment. Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped, in accordance with 1926.601(b)(6), to provide adequate protection for the operator during loading and unloading operations.

..1926.651(f)

(f)

Warning system for mobile equipment. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system shall be utilized such as barricades, hand or mechanical signals, or stop logs. If possible, the grade should be away from the excavation.

(g)

Hazardous atmospheres -

(g)(1)

Testing and controls. In addition to the requirements set forth in subparts D and E of this part (29 CFR 1926.50 - 1926.107) to prevent exposure to harmful levels of atmospheric contaminants and to assure acceptable atmospheric conditions, the following requirements shall apply:

(g)(1)(i)

Where oxygen deficiency (atmospheres containing less than 19.5 percent oxygen) or a hazardous atmosphere exists or could reasonably be expected to exist, such as in excavations in landfill areas or excavations in areas where hazardous substances are stored nearby, the atmospheres in the excavation shall be tested before employees enter excavations greater than 4 feet (1.22 m) in depth.

(g)(1)(ii)

Adequate precautions shall be taken to prevent employee exposure to atmospheres containing less than 19.5 percent oxygen and other hazardous atmospheres. These precautions include providing proper respiratory protection or ventilation in accordance with subparts D and E of this part respectively.

(g)(1)(iii)

Adequate precaution shall be taken such as providing ventilation, to prevent employee exposure to an atmosphere containing a concentration of a flammable gas in excess of 20 percent of the

lower flammable limit of the gas.

..1926.651(g)(1)(iv)

(g)(1)(iv)

When controls are used that are intended to reduce the level of atmospheric contaminants to acceptable levels, testing shall be conducted as often as necessary to ensure that the atmosphere remains safe.

(g)(2)

Emergency rescue equipment.

(g)(2)(i)

Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall be attended when in use.

(g)(2)(ii)

Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be individually attended at all times while the employee wearing the lifeline is in the excavation.

(h)

Protection from hazards associated with water accumulation.

(h)(1)

Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation. The precautions necessary to protect employees adequately vary with each situation, but could include special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of a safety

harness and lifeline.

..1926.651(h)(2)

(h)(2)

If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations shall be monitored by a competent person to ensure proper operation.

(h)(3)

If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains will require an inspection by a competent person and compliance with paragraphs (h)(1) and (h)(2) of this section.

(i)

Stability of adjacent structures.

(i)(1)

Where the stability of adjoining buildings, walls, or other structures is endangered by excavation operations, support systems such as shoring, bracing, or underpinning shall be provided to ensure the stability of such structures for the protection of employees.

(i)(2)

Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

(i)(2)(i)

A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

(i)(2)(ii)

The excavation is in stable rock; or

..1926.651(i)(2)(iii)

(i)(2)(iii)

A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

(i)(2)(iv)

A registered professional engineer has approved the determination that such excavation work will not pose a hazard to employees.

(i)(3)

Sidewalks, pavements and appurtenant structure shall not be undermined unless a support system or another method of protection is provided to protect employees from the possible collapse of such structures.

(j)

Protection of employees from loose rock or soil.

(j)(1)

Adequate protection shall be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

..1926.651(j)(2)

(j)(2)

Employees shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet (.61 m) from the edge of excavations, or by the use of retaining devices that are sufficient

to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

(k)

Inspections.

(k)(1)

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the competent person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably anticipated.

(k)(2)

Where the competent person finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

(l)

Fall protection.

(l)(1)

Walkways shall be provided where employees or equipment are required or permitted to cross over excavations. Guardrails which comply with 1926.502(b) shall be provided where walkways are 6 feet (1.8 m) or more above lower levels.

[59 FR 40730, Aug 9, 1994]

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OSHA Regulations (Standards - 29 CFR)

Requirements for protective systems. - 1926.652

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- **Standard Number:** 1926.652
 - **Standard Title:** Requirements for protective systems.
 - **SubPart Number:** P
 - **SubPart Title:** Excavations
-

Interpretation(s)

(a)

Protection of employees in excavations.

(a)(1)

Each employee in an excavation shall be protected from cave-ins by an adequate protective system designed in accordance with paragraph (b) or (c) of this section except when:

(a)(1)(i)

Excavations are made entirely in stable rock; or

(a)(1)(ii)

Excavations are less than 5 feet (1.52 m) in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

(a)(2)

Protective systems shall have the capacity to resist without failure all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

..1926.652(b)

(b)

Design of sloping and benching systems. The slopes and configurations of sloping and benching systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (b)(1); or, in the alternative, paragraph (b)(2); or, in the alternative, paragraph (b)(3); or, in the alternative, paragraph (b)(4), as follows:

(b)(1)

Option (1) - Allowable configurations and slopes.

(b)(1)(i)

Excavations shall be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal), unless the employer uses one of the other options listed below.

(b)(1)(ii)

Slopes specified in paragraph (b)(1)(i) of this section, shall be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B to this subpart.

(b)(2)

Option (2) - Determination of slopes and configurations using Appendices A and B. Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in appendices A and B to this subpart.

(b)(3)

Option (3) - Designs using other tabulated data.

(b)(3)(i)

Designs of sloping or benching systems shall be selected from and in accordance with tabulated data, such as tables and charts.

(b)(3)(ii)

The tabulated data shall be in written form and shall include all of the following:

..1926.652(b)(3)(ii)(A)**(b)(3)(ii)(A)**

Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

(b)(3)(ii)(B)

Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;

(b)(3)(ii)(C)

Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(b)(3)(iii)

At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(b)(4)

Option (4) - Design by a registered professional engineer.

(b)(4)(i)

Sloping and benching systems not utilizing Option (1) or Option (2) or Option (3) under paragraph (b) of this section shall be approved

by a registered professional engineer.

(b)(4)(ii)

Designs shall be in written form and shall include at least the following:

(b)(4)(ii)(A)

The magnitude of the slopes that were determined to be safe for the particular project;

..1926.652(b)(4)(ii)(B)

(b)(4)(ii)(B)

The configurations that were determined to be safe for the particular project;

(b)(4)(ii)(C)

The identity of the registered professional engineer approving the design.

(b)(4)(iii)

At least one copy of the design shall be maintained at the jobsite while the slope is being constructed. After that time the design need not be at the jobsite, but a copy shall be made available to the Secretary upon request.

(c)

Design of support systems, shield systems, and other protective systems. Designs of support systems , shield systems, and other protective systems shall be selected and constructed by the employer or his designee and shall be in accordance with the requirements of paragraph (c)(1); or, in the alternative, paragraph (c)(2); or, in the alternative, paragraph (c)(3); or, i the alternative, paragraph (c)(4) as follows:

(c)(1)

Option (1) - Designs using appendices A, C and D. Designs for timber shoring in trenches shall be determined in accordance with

the conditions and requirements set forth in appendices A and C to this subpart. Designs for aluminum hydraulic shoring shall be in accordance with paragraph (c)(2) of this section, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with appendix D.

..1926.652(c)(2)

(c)(2)

Option (2) - Designs Using Manufacturer's Tabulated Data.

(c)(2)(i)

Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data shall be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

(c)(2)(ii)

Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

(c)(2)(iii)

Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system. After that time this data may be stored off the jobsite, but a copy shall be made available to the Secretary upon request.

(c)(3)

Option (3) - Designs using other tabulated data.

(c)(3)(i)

Designs of support systems, shield systems, or other protective systems shall be selected from and be in accordance with tabulated data, such as tables and charts.

(c)(3)(ii)

The tabulated data shall be in written form and include all of the following:

(c)(3)(ii)(A)

Identification of the parameters that affect the selection of a protective system drawn from such data;

..1926.652(c)(3)(ii)(B)

(c)(3)(ii)(B)

Identification of the limits of use of the data;

(c)(3)(ii)(C)

Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

(c)(3)(iii)

At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, shall be maintained at the jobsite during construction of the protective system. After that time the data may be stored off the jobsite, but a copy of the data shall be made available to the Secretary upon request.

(c)(4)

Option (4) - Design by a registered professional engineer.

(c)(4)(i)

Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, shall be approved by a registered professional engineer.

(c)(4)(ii)

Designs shall be in written form and shall include the following:

(c)(4)(ii)(A)

A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

(c)(4)(ii)(B)

The identify of the registered professional engineer approving the design.

..1926.652(c)(4)(iii)

(c)(4)(iii)

At least one copy of the design shall be maintained at the jobsite during construction of the protective system. After that time, the design may be stored off the jobsite, but a copy of the design shall be made available to the Secretary upon request.

(d)

Materials and equipment.

(d)(1)

Materials and equipment used for protective systems shall be free from damage or defects that might impair their proper function.

(d)(2)

Manufactured materials and equipment used for protective systems shall be used and maintained in a manner that is consistent with the recommendations of the manufacturer, and in a manner that will prevent employee exposure to hazards.

(d)(3)

When material or equipment that is used for protective systems is damaged, a competent person shall examine the material or equipment and evaluate its suitability for continued use. If the competent person cannot assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service, and shall be evaluated and approved by a registered professional engineer before being returned to service.

(e)

Installation and removal of support -

(e)(1)

General.

(e)(1)(i)

Members of support systems shall be securely connected together to prevent sliding, falling, kickouts, or other predictable failure.

..1926.652(e)(1)(ii)**(e)(1)(ii)**

Support systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

(e)(1)(iii)

Individual members of support systems shall not be subjected to loads exceeding those which those members were designed to withstand.

(e)(1)(iv)

Before temporary removal of individual members begins, additional precautions shall be taken to ensure the safety of employees, such as installing other structural members to carry the loads imposed on the support system.

(e)(1)(v)

Removal shall begin at, and progress from, the bottom of the excavation. Members shall be released slowly so as to note any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation.

(e)(1)(vi)

Backfilling shall progress together with the removal of support

systems from excavations.

..1926.652(e)(2)

(e)(2)

Additional requirements for support systems for trench excavations.

(e)(2)(i)

Excavation of material to a level no greater than 2 feet (.61 m) below the bottom of the members of a support system shall be permitted, but only if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

(e)(2)(ii)

Installation of a support system shall be closely coordinated with the excavation of trenches.

(f)

Sloping and benching systems. Employees shall not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

(g)

Shield systems -

(g)(1)

General.

(g)(1)(i)

Shield systems shall not be subjected to loads exceeding those which the system was designed to withstand.

(g)(1)(ii)

Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of sudden lateral loads.

(g)(1)(iii)

Employees shall be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

..1926.652(g)(1)(iv)

(g)(1)(iv)

Employees shall not be allowed in shields when shields are being installed, removed, or moved vertically.

(g)(2)

Additional requirement for shield systems used in trench excavations. Excavations of earth material to a level not greater than 2 feet (.61 m) below the bottom of a shield shall be permitted, but only if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

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